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EDITORIAL — SOME HIGH LIGHTS

General Economic Scene:

National:

Annual Economic Survey: The review of 1971-72 rightly starts with the extra economic calls on the economy; the 10 million Bangla Desh refugee influx, the Indo-Pakistan War, the rehabilitation needs of independent Bangla Desh, the natural calamities caused by floods, typhoon and draught, war damage, and international monetary and political developments including the cessation of U.S. aid. The response of the economy to these unusual demands are noted with some satisfaction. Rs. 500 crores as aggregate revenue resources, Rs. 293 crores in net market borrowing, Rs. 875 crores in foreign exchange, reserves, despite a steep rise in payments for imports for IMF debt and service charges and 2.7 percent price increase and despite an increase of Rs. 625 crores in money supply and of Rs. 454 crores in Reserve Bank of India credit to the Government. Food production continued for the fourth year to perform satisfactorily at a rate well above 6 percent with 8 million tonnes of stocks. The review of the economy however, points up the serious tasks ahead. The Industrial sector growth is in inverse relation to that of agriculture. It has declined from 6.8 percent in 1969-70, to 3.7 percent in 1970-71, and for 1971-72 the government forecast is 4 percent, the N.C.A.E.R. is 3 percent and this Bulletin's is 1.9 percent. The major problem thrown up by the review is the stagnation and decline in the development investment of the country. Such investment is the basis for the growth and health of the economy. In the public sector investments have declined by 40 percent and constitute around 8 percent of GNP against the 12 percent Plan target and 11 percent achievement 3 years ago. The total investment effort revealed by the survey is that of the private sector continuing its contribution at 9 percent, while that of the public sector falling to less than 2 percent. The public sector has not only not contributed to savings, in some cases the returns have not been adequate to cover depreciation costs. Stagnant public investment is the principal reason for the year's industrial stagnation because of the multiplier relationships of such investments to other economic sectors. The task ahead is to make the public sector contribute to the savings and investment demands of the economy and this is essentially a call for a clear strategy frame and management improvement for this decisive sector of the economy. The other conclusions of the review of the past year as they relate to the 1972-73 effort are inescapable. There is need for an expanded export effort based on quality production and reduced unit costs, a careful rationalisation of our import bill, stepping up both priority production of goods of mass consumption and rapid and selective import substitution, review of food grains procurement and issue prices which will currently raise the food subsidy to Rs. 120 crores for this year and a more appropriate Centre-State financial relationship so that the States can carry out fully and effectively their developmental role and contribute further to the attack against poverty and all of them join in an intensified effort to mobilise the resources that the National and State Plans demanded.

As pointed out in the last issue of the Bulletin, few of these conclusions are incorporated in the Budget, as they relate to overall and sectoral economic policies and their related instruments and sub-instruments. Budget policy as set forth in the current year's budget is neutral except in regard to the need for improved Centre-State financial relations. In this regard the directives to the Sixth Finance Commission to work towards a system of real financial devolution covering the entire range of the Central and State functions and ranging over all Plan and non-Plan expenditure become important. The worrying problems of States indebtedness and overdrafts also need a long term solution. For the current year, the short term palliative is for the Reserve Bank of India's limits to its ways and means advances to States being increased. The overall deficit in the 1972-73 State budgets amount to Rs. 250 crores, while Tamil Nadu, Maharashtra and Gujarat have surplus budgets. Here again the Finance Commission can recommend long term measures including debt conversion into grants, rescheduling etc. There are of course wider issues involved in separating Central and State sources of revenue to which reference was made in the last issue. Another instrument announced is the 1972-73 foreign trade policy which aims at increased exports and reduced imports. The need based import programme which continues imports of raw materials and components used by the 54 priority industries bars 16 items and reduces the quotas for 29 others which are available within the country and adds 56 items worth Rs. 100 crores, making a total of 168 import items which will be handled by public agencies. What is decisive here for growth, production and expanded exports is for the precise items required by the industrial units to be available on time and at prices equal to landed costs. Another issue relates to the mobilisation of resources, where for the current year the Centre's additional revenues will amount to Rs. 150 crores and that of the States to Rs. 80 crores. Further efforts will depend on decisions concerning black money, tax evasion and the growing rural surpluses. Finally, policy has yet to be framed with regard to the major bottleneck to growth revealed by annual survey—the performance of the public sector undertakings and their lack of contribution to public savings. The provisions in the annual plan for increased output from existing capacity in steel and fertilisers, and for expansions and new projects, and the modernisation of export oriented industries no more than lay the ground-work for this sector to cease its stagnant role in developmental investment. The management and policy frame which will ensure the generation of public savings has yet to be enunciated.

Railways: The railway performance in 1971-72 show gross traffic receipts at Rs. 1078 crores, outgoings at Rs. 916.71 crores, dividend to general revenues at Rs. 152.15 crores, ending with a surplus, the first since 1966-67, of Rs. 9.08 crores. This record has its pluses and minuses. 2000 special trains run during the 14 day war, 800 trains run for moving refugees back to Bangla Desh and trains porting prisoners of war, the increased earning on other coaching traffic by Rs. 6.5 crores, the absorption of the interim relief in the wage bill of the staff and the long awaited well justified reduction of Rs. 21.53 crores in dividends and interest on capital which is not productive but invested in non-strategic remunerative and over capitalised works and those in progress and the 3.28 percent improvement in suburban traffic—all these are pluses. On the other hand the record shows a worrying short-fall in targets achievement—passenger transportation by 0.61 percent, freight traffic by 4.99 million tonnes. The reason given that this was due to public and private sector industries, particularly steel production, having failed to attain their production targets is not the whole story. Earlier issues of the Bulletin (Vol. I, Nos. 6, 8, 10, 11) have called attention to the lack of wagons for transporting fertilisers,

cement, heavy chemicals, coal, food grains etc. While coal was accumulating at the pitheads in Bihar, Gujarat which is suffering from serious power famine was not allocated the necessary wagons to haul the coal. Vol. I, No. 10 of the Bulletin called attention to for the crisis faced by the cement industry in Tamil Nadu because it could not transport its production to the north due to non-availability of wagons. Hence an equally valid reason the poor performance in freight traffic is poor planning, scheduling and turn around of wagons in the railway system. In fact if this trend is not corrected, the targets and their revision will lose all meaning. We started with a target of 340 million tonnes of traffic for the end of the Fourth Plan, scaled it down to 320 millions, revised it down further to 240 millions and it looks doubtful if we will exceed 200 million tonnes for 1971-72. Against this background, the programme proposed for 1972-73 can be examined. For this year total earnings are estimated at Rs. 1143.10 crores and total expenditures at Rs. 1111·47 crores, yielding a surplus of Rs. 32·53 crores. This surplus again comprises of two elements. The first is the result of the reduction of interest and dividend payment of Rs. 22 crores and the second the result of increased passenger fares and freight charges which will yield Rs. 17 crores. Added to the increased charges which yielded Rs. 35 crores last year, this year's programme does represent the railway's contribution to resource mobilisation, particularly to meet its increased Plan outlay of Rs. 125 crores during the last two years of the Plan. What is needed now is improved planning and administration of the railway system so that there can be a quicker turn around of wagons, decentralised decision making and elimination of bottlenecks. There are also needed measures to prevent the increased charges becoming a cost escalation factor. These together with rationalisation of freights charges and increased agricultural, industrial and mining activity should help in attaining the freight target of an additional 9·5 tonnes. For the Southern Railway which ended last year with 12 percent (Rs. 12 crores) loss, a similar decentralized, flexible and innovative programme, together with not being required to pay interest and dividends on capital invested in schools, hospitals, staff housing plus a programme of dieselisation, conversion into broad guage and closing uneconomic lines should make this sector more than pay its way.

The Tax Structure: The tax structure of the country needs reform. It is too narrow in direct taxation—Income and wealth tax has risen from 2.4 percent of national income in 1950–51 to a mere 3.0 percent of the national income in 1970–71. It is too broad as far as indirect taxation is concerned. The indirect tax yield has jumped from 4.2 percent of the national income in 1950-51 to 11 percent in 1970-71. The inelastic structure makes further tax yields difficult. There are no cushions for the future or in an emergency, short of taxing the poor or generating an inflationary spiral. The structure is lopsided in favour of the agro–rural sector. With a national income of Rs. 40,000 crores, half of which is contributed by the agro-rural sector, the latter contributes a little over Rs. 100 crores in taxes while the urban manufacturing sector contributes around Rs. 700 crores. The narrow structure with its steep marginal rates of taxation which are confiscatory has made for the twin problems of tax evasion and the parallel economy run by black money. This double feature of tax evasion and unaccounted money is quantitatively terrifying. In 1968-69 the tax evaded is computed at Rs. 470 crores against a taxable income of Rs. 1400 crores. In that year volume of concealed business deals, gold and luxury articles smuggling, benami assets transactions, purchasing of licences, quotas and scarce raw materials donations to political parties, payments as bribes and other corrupt practices, conspicuous consumption are guessed Rs. 7,000 crores, with the proviso

that it may well exceed Rs. 14,000 crores. In other words, the equivalent of somewhere around 75 percent of the direct tax revenues are evaded and the equivalent of a third of G.N.P. constitutes the parallel economy. Against this background the recommendations of the Direct Taxes Inquiry Committee form a structured and coordinated basis for the reform of the system. The recommendations included (i) reduced tax rates at the middle and lower levels and a ceiling of 75 percent including surcharge for the highest level. This will reduce the temptation to evasion and increase the tax paying numbers: (ii) the taxing of agricultural incomes on somewhat of a par with other incomes. This is the specific task of the Raj committee which will look into all the issues involved. The base here is likely to narrow with the implementation of land ceiling legislation in the States. The agricultural income tax could be collected by the Centre but should accrue wholly to the States: (iii) a review and stream lining of all existing controls, licenses and permits with a view to discouraging the parallel economy. Tax evasion and black money as seen earlier have multiple causes which include the economy of shortages and consequent controls and licenses, donations to political parties, corrupt business practices, ceilings on business expenses, high rates of sales tax, ineffective enforcement of tax legislation etc. Hence the reform must cover all these causes: (iv) excise duties should gradually replace the present system of sales tax: (v) the creation of a Direct Taxes Settlement Tribunal in the Income tax department to settle with errant tax payers: (vi) the government financing of political parties and annual publication of their audited accounts, (one of the major uses of black money is the donations made to political parties) limiting donations by individuals to 10 percent of income up to Rs. 10,000: (vii) each tax payer to have a permanent account number to be used for all tax, banking and other transactions and banks to supply information on the accounts to the department on request: (viii) Banks to require a 3 year tax clearance affidavit from large creditors: (ix) incomes of husband and wife to be treated separately: (x) a capital tax on companies to replace the current surcharge: (xi) stringent application of the Stamp Act on all immovable property transactions (which is another important area of the black money operations): (xii) 65 percent tax on all ghost of anonymous donations to so called charitable trusts together with national legislation to control and regulate the working of various public charitable and religious trusts: (xiii) a complex of judiciary, administrative and investigative powers to liquidate tax arrears: (xiv) filing of agreements and contracts of film artistes engagement: (xv) starting a National Development Fund to which a tax deductible seven year contribution of 10 percent of income up to Rs. 20,000 which will earn a tax free interest of 4.5 percent. This package of measures should now be embodied in legislation to reform the tax structure and help to bring back some modicum of integrity and honesty in personal and public life. By itself the package will not solve all the problems of evasion and the parallel economy. But it does provide a start for a return to some of our basic values.

Banking Reform: 40 years after the report of the Central Banking Enquiry Committee in 1931, a voluminous 400 page Report on Banking reorganisation is now before the parliament and the public. The background to the report and the future it addresses are important elements. In the last five years there has been a rapid spread of banking, the nationalisation objectives of correlating credit with priority areas related to growth, social justice and stability have been established, the complete monetisation of the economy should be completed by the end of the Sixth Plan and a four fold increase in deposits by that time period attained. To the triple national objectives of growth, social justice

and stability, is now added a fourth imperative—self reliance. It is against this general background that the 411 recommendations of the Saraiya Commission should be examined and debated in order to arrive at a consensus on its four main proposals. The tests to be applied are self evident. First the banks must operate as banks on sound and accepted banking business principles. Second they must be instruments in the attainment of the four national goals. Third they must be adapted to the vast and variegated human, economic and culture landscape that this country represents (so that no simple transposition of banking developments from U.S. or U.K. or Japan is of real relevance). The development functions of the States must carry adequate financial resources. The major issues posed by the Commission are structural, functional, coordinational and administrative and on each there is need for wide ranging debate in each State among business and agricultural specialists. trade union and co-operative leaders the academic and the banking community. The structural issue is that the commission recommends that the present 22 nationalised banks should be reorganised into 2 or 3 all India Banks operating up to the district level and 5 or 6 regional banks functioning in regionally contiguous areas. Private commercial banks would be merged with the nationalised banks and chit funds are to be regulated through an enactment of an All India Chit Fund Act. The issues raised here are whether the proposed structure which will make for uniformity in application of policies, will meet the priority needs of particular areas speedily and if there will be improvement in services. For this the number of institutions suggested should be examined together with the nature of decentralization measures proposed—branch office autonomy, zonal offices which will guide 200 to 300 branches etc. What is the structure which will arm the States with financial institutions commensurate with their development responsiblities? The functional prosposals relate mainly to developing a wide net work of rural banks to promote the banking habit among the farmers through providing them with primary credit cooperative societies or rural banks serving a compact group of villages with 5000-20,000 people. Such a network should cater for the full credit needs of all small and medium farmers, offering higher interest rates than the parent bank, making FCI payments to the farmers and a flexible system of production loans with eligibility, repayment and rescheduling arrangements tailored to each case. Similarly a programme of combined savings and borrowings for small artisans, soft loans to technicians and the development of non-financing multipurpose agencies to provide advice and guidance on inputs, markets etc. to small industries and operators, the merging of Agricultural Finance and Agricultural Refinance corporations, a National system of opening new banks, the grant of adequate credit to the building industry and the corporate sector, the setting up by the commercial banks of merchant banks at Bombay, Calcutta, Delhi and Madras, the setting up of new investment companies in association with the capital market and buying and leasing of equipment by the commercial banks—are other recommendations. In this complex of recommendations is included the suggestion that co-operative credit be transferred from the State list to the Central list through a constitutional amendment because cooperative credit is derived from the Central Government and the Reserve Bank. This is arguing in a vicious circle. The structural reform must equip the States financially to carry out their agriculture, small industry and anti-poverty programmes and co-operative credit is part of this totality. Further the viability of cooperative credit must be looked at from a longer term perspective and not in terms of current sources. The coordinational proposals include starting clearing houses in centres where more than 3 banks operate, establishing a credit intelligence bureau for compiling and furnishing credit information

to all financial institutes and the development of a new set of relations between commercial and indigenous banks. Finally the administration proposals include a modest mechanisation programme using computers to reconcile branch transactions, setting up a common agency for recruitment of clerical and junior bank staff and standardisation of salaries and emoluments.

Pilot experiment to help poor sections and self employment: After a year's discussion, a small programme has been launched under which commercial banks will lend upto Rs. 20 crores per annum (which is ½ percent of their aggregate lending) at 4 percent (which is 2 percent below the Bank rate and 8 percent below the normal secured commercial loans rate) to groups not covered by the Small Farmer Development Agency and Marginal Farmers and Agricultural Labourers schemes—SFDA and MFAL. These loans at 4 percent interest and on soft terms will be available to (a) scheduled castes/tribes workers (b) those engaged in processing agricultural and forestry products and fisheries (c) tailors (d) cobblers (e) rickshaw wallahs (f) tea and coffee stall owners (g) students etc. and will be operated by about 10 percent of the branches of each commercial bank. This programme is technically sound in so far as it does not raise the cost of productive loans and credit, promotes self employment and small operations and further aids the national banks to work with the neglected sector. The main problem that this neglected and economically backward group faces as pointed out in Vol. I No. 1 and Vol. II No. 1 of the Bulletin is not the rate of interest that they pay but the timely availability of the resources and the inputs they represent. It is the last factor which will decide the effectiveness of this important pilot effort.

Bangla Desh: The rehabilitation of the 10 million returning refugees is a priority task which the government of Bangla Desh is undertaking within such U.N. help as is slowly trickling through. India's aid to Bangla Desh registered two further steps in March. Foodgrains are beginning to flow and by the end of June 500,000 tonnes would have been supplied. Second under a trade agreement signed, a balanced Rs. 50 crores trade the excess free foreign exchange is to be provided by India. Indian exports to Bangla is in rupees and for Desh will include cement (Rs. 4.5 crores) cotton textiles (Rs. 25 lakhs) cotton yarn (Rs. 1.5 crores) Coal (Rs. 4 crores) Chemicals and pharmaceuticals (Rs. 25 lakhs) etc. India will import from Bangla Desh fresh fish (Rs. 9 crores) newsprint (Rs. 3 crores), molasses (Rs. 25 lakhs) etc. The agreement is important to both countries. It regulates and normalises the border trade between Bangla Desh and the five surrounding Indian States and territories and thus restores normalcy to that area and lays the basis for mutually reinforcing growth. It also provides transit arrangements for Nepal's trade with Bangla Desh. The rupee and free foreign exchange trade sectors lay the basis for further probing and developing the complementary nature of the two economies.

Aid: Foreign aid for the current year 1972-73, after meeting repayment obligations resulting from past loans is likely to be Rs. 363 crores. The gross aid will be Rs. 614.73 crores, which comprises all loans, no P.L. 480 and last year's aid from U.S. before the cut went into effect. The repayment of past foreign aid to the United States will amount to Rs. 251.97 crores. We are now reaching a stage when the servicing of past aid is equal to fresh loans received as aid. By the end of the Fourth Plan servicing will exceed net inflows. That is the meaning of self reliance. It does not mean refusal of aid. All concessional loans offered without conditions will be welcomed. Such loans will not total more than the previous year's total. Its major purpose is to help servicing past loans.

State

Supplementary estimates: With the passing of the 1972-73 budget (see the last issue of the Bulletin) with a few modifications such as the reduction of the tax on trucks from 10 to 5 percent and the implicit promise to groups of teachers and veterinary graduates, a supplementary budget of Rs. 116.34 crores for the year 1971-72 was approved by the legislature. The supplementary estimate included four main elements. First Rs. 37 crores as further repayment to the Centre of the loan repayment and the Reserve Bank of India. Second an equal amount to meet the enhanced State Plan for 1971-72 and the second pay commission proposals. Third Rs. 218 lakhs to meet additional expenditures on sugar sales and other civil supplies and Rs. 57 lakhs as interim compensation to four transport undertakings. The supplementary estimates once more emphasise the urgency of placing Centre-State financial relations on a reasonable and national footing. On the transport costs, the 1972-73 prospects seem somewhat bright. Since 1963-64 this service has both deteriorated in quality and has been a heavy source of loss to the State. The 1970-71 deficit was Rs 102 lakhs and for 1971-72 was nearly double at Rs. 191 lakhs. From the existing service the estimate for 1972-73 is a profit of Rs. 63 lakhs to which the profits of the four new autonomous corporations should be added. With the near doubling of the work load, the management services of their sector become crucial for quality and profitable operation.

Rural Development: The States record in rural development continues to present success and challenging phases. Rural electrification has passed the 90 percent mark with 14,124 villages being electrified. In fact with this attainment, the State's ranking as an advanced State is low in obtaining resources from the Rural Electrification corporation. As against 11 projects sanctioned for the two years 1970-72 which covered 1416 villages in North Arcot, South Arcot, Salem, Coimbatore, Tiruchirapalli, Madurai, Ramanathapuram and Tirunelveli districts to energise 28,209 agricultural pump sets, provide connection for 126 low tension industries and 58 agro industries, for the current year 3 projects valued at Rs. 2 crores have been approved for the districts of Dharmapuri, Salem and Coimbatore. From now the completion of this important programme will call for further mobilisation of the States' resources and involve borrowing capacity of the Tamil Nadu Electricity Board. The quantitative aspect of education is also formidable. Out of 21,900 panchayat union schools, only 14,930 are accommodated in their own buildings. A large scale programme of modest rural school buildings is needed. The school estimates showed that 100,000 more pupils will be added in 1972-73 to the 52.31 lakhs now in elementary school. The 16,000 teachers to be recruited gives a sombre teacher pupil ratio of 1:62. This whole arithmetical exercise is however suspect. The enrolment figures are spurious and inflated with the dropouts at over 60 percent. The Primary health centres are unable to provide medical services for the vast areas they now cover and the system of rural roads on which the marketing of rural products and urban exports depend need to be rapidly expanded. Between 1968-1971, the progress has been 1000 kms per annum in link roads. What is needed is a stepped up programme which is also income and employment generating, of link roads, access roads, upgrading of surface roads and metal roads. The addition of the Palayamcottai-Tuticorin High Road to the National High Way System should be followed up with a plan to develop link and access roads in that area.

Prices: Further to the analysis of price movements in the last issue of the Bulletin where the modest 1971 price rise of 2.7 percent was analysed, the consumer price index for February shows a fall of 38 points, while January registered a rise of 28 points. Questions have been raised in the Assembly and other forum in the State as to the methodology of the compiling and computing the index. The compilation of the prices of the bundle of goods and services which constitute the index is a regular ongoing service of the State department of statistics and the mix of the constituents is wide and representative. The computing of the index is undertaken by the Central government and the behaviour of the index conforms to the analysis offered in the last issue of the Bulletin. There are two further factors to be taken into consideration as of April. First is the question of food grains prices—which refer in the main to wheat. There is need to review and revise downward the procurement prices and increase the issue prices of wheat in the 1972-73 marketing season as recommended by the Agricultural Prices Commission and printed in the Budget. The buffer stock position is likely to reach 10 million tonnes with its heavy incidence on interest rates, which will climb from the current Rs. 50 crores to Rs. 70 crores, along with problems of storage and wastage. If adequate marketing is arranged, so that surplus production is speedily distributed to the food deficit States and distribution functions smoothly there need be neither a decline in prices during the post-harvest months nor a price rise in the leaner months. The budget provision of Rs. 100 crores, when current procurement policies will demand 20 to 30 percent more of resources indicates the need to adjust procurement prices. The other problem is the effect of increased excise and sales duties in the National and State Budgets on prices. The Economic Times analysis is that the Budget is likely to increase wholesale prices by 5 to 6 percent. The following table summarises this forecast.

TABLE

Selected commodity group	*Expected additional % rise due to proposed levies*	*Expected total % rise in 1972-73 over 1971-72*
1. Fuel, power, light and lubricants	2.0	7.9
2. Liquor and tobacco	2.5	7.5
3. Machinery and transport	4.0	11.1
4. Manufactures	5.0	12.9
All commodities	2.5	6.0

The analysis of price movements in Tamil Nadu warns of rises in the price of paper, particularly printing paper and paper boards, in paints, aluminium, stainless steel and household utensils. These trend analysis are useful in that they warn the consumers, producers and government of the market forces which need to be watched and if needed controlled to keep price rises within the range of the practicable.

Debt Relief: A bill to provide relief from usurious interest payments by labourers, wage earners, government servants and other low income groups in the State is enacted. All those whose income is below Rs. 7,200 per annum and exempt from income tax are eligible for relief. Where any debtor has paid a creditor, twice the amount of the principal, the debt is cancelled. All interest outstanding on October 1, 1971 is cancelled

and only the remaining principal will be payable. For all debts contracted after October 1, 1971, interest will be payable at a maximum of 5 percent per annum. This legislation is part of the State attack on poverty and provides real relief to the low income groups.

Lead bank and area development: Following its deposit mobilisation drive last year when the Indian Overseas Bank initiated five new schemes—family benefit deposits, automatic cumulative wedding deposits, life insurance linked savings deposits and jewellery loan deposits, the Bank has now initiated area surveys for the development of districts for which it acts as the lead bank. For five districts—Ramanathapuram, Kanayakumari, Thanjavur, Tiruchirapalli, and Tirunelveli—area surveys leading to identification of growth centres and potential and the consequent territorial and sectoral credit gaps are under way. In the case of Ramanathapuram, agriculture and fisheries development projects have been drawn up and with the aid of the Agricultural Finance Corporation, the programme is now being executed. The State Planning Commission's wider techno-economic surveys of the two backward districts—Ramanathapuram and Dharmapuri—and the Regional Plan now being completed by Regional Planning directorate, will provide the investment base for the development of these retarded areas.

International:

UNCTAD III: The United Nations Conference on Trade and Development (UNCTAD) meeting for the third time in Santiago de Chile from April 13 has the responsibility of translating the International Development strategy of the Second Development Decade into an action programme. Its background and review of how far the Delhi decisions of UNCTAD II have been executed present a bleak picture. Monetary reform has been carried out without reference to the developing countries. The Generalised System of Preferences is still in the talking stage with the major countries like the U.S.A. and the developed countries being preoccupied with applying the principle of reciprocity in the GATT negotiations among themselves. Not one new commodity agreement has been concluded since Delhi, the wheat, sugar, tin agreements having been renewals of previous agreements. Trade for the developing countries means commodity exports on which their foreign exchange earnings depend. Instead their foreign trade expanding at the rate of 7-8 per annum as agreed in the International development strategy the share of the developing countries in world trade has shrunk to 18 percent, their share of manufactures and semi-manufactures having fallen to 5.5 percent. Tariff and non-tariff barriers have hindered exports of their products in which they have a comparative advantage (because they are labour intensive and resource based). The special arrangements for the least developed countries, the supplementary financing for those experiencing temporary short-falls and their diminishing share in world shipping continue as problems. The aid pledge of 1 percent, of the combined national income of the developed countries so badly needed by the least developed countries has proved to be an empty promise the actual quantum of aid declining since the start of the second decade.

It is against this grim but realistic background that the 141 countries including the People's Republic of China which will be participating for the first time, have yet another chance of arriving at a practical programme through a few new real agreements which can push development forward. Development is a national responsibility and is currently being borne by the developing countries up to 90 percent. But the international context

in which development is taking place must not hold back these efforts and must give it some push forward in the common interest of the developed countries. The priorities for UNCTAD III are few and must be maintained at a few selective items. The Lima declaration is a good declaration of principles on the basis of which a practical programme should be drawn up. That programme should revolve around five essentials. (a) The Generalised System of Preferences must be put into effect by the United States, the enlarged Common Market and Japan (b) For the least developed countries in particular, some four or five commodity agreements together with a Special Fund should be agreed upon (c) Agreement on reduced shipping freights and some enlargement of the microscopic share of world shipping among the developing countries (d) The linking of prices of certain raw materials to finished products. In particular such a link should be established between iron ore prices and steel prices. (e) The 1 percent aid target with 70 percent of it being official loans and grants and a comprehensive monetary reform centred around a fairer and more adequate distribution of S.D. Rs. should be ensured. Above all a real start should be made in expanding trade among the developing countries based on the fact of the complementary nature of their economies. For this the Regional Economic Commissions should be the main instruments for developing the frame work for such expanding trade among the developing countries. Ecafe's coconut community and pepper community and the East African community are cases in point. In developing these regional and interregional arrangements, the proposal to divide the world economy into four major blocks, (a) the Soviet Union and the East European countries (b) China (c) the enlarged Common Market and Africa and (d) the Dollar group—North America, Latin America, Japan, Australia and Canada or other such divisions constitute a turning away from the Breton Woods trade and monetary systems and will be a means of imposing further blocks on the development of the poor countries. UNCTAD III represents a further important chance for world development and world trade expansion in which all—developed and developing countries—have stake.

Human Environment Conference: Preparations at the inter governmental and non-governmental levels in preparation of the Human Environment Conference to be held in Stockholm in June are now being completed. A report on the state of the human environment—the intellectual conceptual framework of the conference—is now ready. It charts the canvas of the present state of knowledge and opinion on relationships between man and his environment as seen by over 100 specialists from sixty countries. In its compilation the Madras Institute of Development Studies participated. The 400 page report provides the policy and scientific background for the formulation of strategies and programmes through which man will shape his environmental future. Preparation by national groups, by UNESCO, FAO, WHO, and other UN agencies by the Seminar organised by the Regional Economic Commissions and the UN preparatory committee and its working groups have helped in producing the main issues for the Conference. A draft declaration which when adopted will represent the first common outlook and principles binding all people about the environment: a strategy and action programme: a new unit in the United Nations to coordinate global environmental activities and administer a small special fund to finance such activities, these are the major issues before the State. In this State a small and active group called the group of 77 has been at work for over a year on a study and action programme on environmental pollution. Its work and that of all those engaged in improving the environment—particularly our neglected, stagnant rural environment—

will receive help and guidance from the Stockholm conclusions. At the National level, a National Council on the environment has been established to develop a programme needed by and adopted to the country.

Limits to Growth: The Club of Rome founded in April 1968 consists of a small group of scientists and men of affairs who have a common problematic approach to the major challenges of our times which are defined as : poverty in the midst of plenty: degradation of the environment: loss of faith in institutions: uncontrolled urban spread: insecurity of employment: alienation of youth: rejection of traditional values: inflation and other monetary disruption. These basic problems are drawn together into a Project on the Predicament of Mankind whose content is common in some ways to all people in all countries and whose elements are interrelated with simultaneous technical, social, economic and political overtones. The conclusions of the first study in the project is posed as a choice. If present growth trends in population, industrialisation, food production, resource depletion and pollution continue, the limits to growth will be irreversably reached in the next hundred years and these will follow a quick and sudden decline in population and levels of living. The alternative is to stop and change the growth trends in order to establish economic and ecological stability and attain a stage of global equilibrium where each person can both meet his material needs and realise his potential. The discussion on the limits to growth and the broad choice facing mankind has been carried further at a recent symposium held at MIT in the United States where despite varying views on the practicalities of the choice posed, the dangers of growth manship were generally accepted. There are of course exaggerations resulting from compartmentalised thinking. There are the differing problems faced by countries at varying levels of wealth and poverty. There are reversible decisions as the link between pollution generating use of certain chemicals and synthetics. Above all there is man and his infinite capacity for innovativeness, erring and capacity to see and overcome his error. The plea for a stationary state is, as old as Plato and as recent as Benthom and Mill in the West. The demand for plain living and high thinking, for economic simplicity, material sufficiency and austerity traditional to Hindu thought became the humanism of Gandhiji: The limits to growth have to be worked out by each community and each individual in terms not of a Static State but a Stationary State in which births and death rates, capital investment and capital depreciation rates are equal, so that capital plant-population ratios are constant and all inputs and output rates births, deaths, investment and depreciation are kept to a minimum. This is the challenge to move from a maximisation psychology to an optimisation objective. And that applies to all of us—particularly to us in India.

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Agricultural Development :

Rice : The samba crop for 1971-72 with its yield of 1207 kilos per acre is the highest yield during the last decade for the State and Country. This record may be bettered with the use of the new IR-24 variety just developed which has a higher yield than IR-8 and IR-20, is more pest resistant, matures 15 days earlier than IR-8 and 10 days before Jaya. It has basumathi's slender grain quality and can be grown in irrigated and rainfed farmlands. To spread this new variety which has been subjected to all the laboratory tests of trial, selection and multiplication, a programme of popularisation is

now under way. Under this programme a number of farmers are chosen and each is given the seed to grow it in an area of 10 to 15 cents along with the variety that he normally uses with the rest of his owned area. As the new strain grows in the midst of the crops to which the farmer is accustomed, he has the opportunity to watch the two performing side by side and decide for himself the relative merits of the new and old strains. This involvement of the farmer in the trial sowing, growing and harvesting of the new variety also places him in a vantage position because he has the seed to proceed to mass produce the new strain in next season and help broadcost its results to other farmers. The new strain IR-24 thus will be heralding a further massive increase in rice production so that the State target of 75 lakh tonnes of food grains for the current year can be attained. The IADP target is 16.50 lakh acres, summ er cropping 3.5 lakh acres, cotton 10,000 acres, gingelly 1 lakh acres, groundnut 50,000 acres, and the Pulses crash programme 1.5 lakh acres.

Wheat: The State is also making its contribution to increased wheat production. The Wellington wheat research station has made available three rust resistant strains—NP 200, NP 201, and NP 202 which are now in general use throughout the country. The Nilgiris is the home of rust inoculum and from there it spreads all over the country. Hence the Wellington programme has successfully concentrated on producing the three high yielding rust resisting varieties. Another programme to develop strains which can be grown in the summer season is now nearing completion. Soon three new varieties HW 124 HW 135 and HW 165 will be released for use in the peninsular parts where trials have shown very good performance. Again to grow wheat in unirrigated and low rainfall areas and the plains bordering the western ghats dwarf wheats and a wheat-rye hybrid, Triticales, are now being perfected. These varieties can be grown in dry areas in the months of November and February as part of a new multicropping pattern in the State. In these western ghats areas and marginal lands along side of the ghats in the State, wheat growing will be possible, where paddy cannot be grown for lack of water.

Cotton: The State's intensive Cotton Development Programme (ICDP) described in Vol II Nos 2 and 3 of the Bulletin, using MUC-58 and suvin in the wet and karungarni in the dry areas has begun to pay off. 200,000 acres, comprising 1.5 lakhs acres in the Coimbatore irrigated belt and 50,000 acres in Tirunelveli dry region came under programme. Apart from MUC-5, PAS. 72, suvin and Karungarni 8 and Bharathi, the use of cycocel, a growth retarding agent which stops excessive vegetative growth and increases the fibre yield and the plant protection programme have added to the bumper crop. 1000 power sprays which could be used by each farmer for 18 to 20 rounds and the aerial spraying of vast areas (17,000 acres plus the 50,000 acre project area) have resulted in high yields. The current annual production is estimated at 450,000 bales, which is 50,000 over last year with a large component of the elite (long staple) cotton variety. For Tamil Nadu, 5 lakhs acres will be covered in 1972-73 under its cotton development programme. And now there is talk of a glut in the cotton market, this year's crop for the country is estimated at 64 lakh bales and a sharp fall in prices is taking place. The goverment has reacted by raising the mills' permissible stock limits by one month, relaxing credit controls, banning further cotton imports (2.5 lakh bales have been cut), and reviewing the support prices level. The Cotton Corporation of India's action to stabilise prices by purchasing more is also a move in the right direction. But the issues need clarification. First there is no glut. Our annual cotton requirement is 65 lakh bales, as pointed

out in Vol I No. 10 of the Bulletin, and with the mills having in the last three years run their stocks low, the current estimated production of 64 lakh bales is a procurement, distribution and marketing problem and not a glut or stockpiling problem. Second the wild price fluctuations can and must be corrected. Digvijay jumped from Rs. 1,215 per candy in 1962 to Rs. 2,000 per candy in the last 3 years, Kalyan from Rs. 1,035 to Rs. 1,300 and so far. Thus against a price jump of Rs. 1,000 to Rs. 1,500 per candy registered last year, the producer faces a fall by Rs. 800 this year. Prices will continue above normal. What is bad is the fluctuating price. Fluctuations in cotton prices are due to fluctuations in cotton crop estimates. Last year the first estimate was optimistic at 62 lakh bales and it swayed around until it was brought down to a pessimistic 52 lakh bales. What is needed for the health and the continued high productivity of this vital sector is a reliable cotton crop forecasting agency. Second there is need for quality controls and grading of the fibre and this must be reflected in the support prices and CCI operations. Third there is need for improved marketing services and some expanded warehousing—all of which will ensure either dispensing with cotton imports or exporting our short staples for the long staple that we need by the end of the Fourth Plan as suggested in Vol II No. 3 of the Bulletin.

Tea: Tea production in the South declined to 10.4 million lbs. for the first three months of 1972 compared to 13 million lbs. for that period in 1971 and 16.7 million lbs. in 1970. The State Budget has not imposed any fresh levies on tea estates in the State and the National Budget also has left tea levies where they are. The case of the tea estates for a development and depreciation allowance is strong and in this regard the new credit policy announced by Reserve Bank of India in the wake of the working group's report should lead to the renovation and expansion of the gardens as recommended in the last issue of the Bulletin. The raising of cash credit limits to 60 percent of turnover or 75 percent of cost, the provision of development finance by a consortiun of lending institutions, the assignment of security—all these should provide the much needed working capital to the industry and term finance for its vast replanting and expansion programme. The one desideratum is that the procedures and practices of the commercial banks and the term lending institutions should be simplified and should lead to speedy decisions. This will balance the escalating costs (In 1930 Rs. 2,500 were needed to bring 1 hectare of land under tea cultivation according to the Tea Board, which till the recent Reserve Bank of India directive has borne the cost of development, albeit moderately which is now Rs. 15,000). With this financial prospects and the research pay off referred to in the last issue of the Bulletin, it should be possible for our tea production to attain its annual targeted production increase of 3 percent.

Groundnut: Another important crop for consumption and production purposes, the packaged programme in groundnuts was analysed in Vol. II No. 3 issue of the Bulletin. The research centres at Tindivanam and Pollachi have continued improving TMV 2 and POL-1 to suit the peculiar agro climatic conditions in the Anamalai area. Now Pollachi has developed a hunch type from a cross between POL 1 and TMV 2. It is a semi-spreading variety called Ah. 2015, matures in 105 days, producing 15 quintals of pods per hectare (an increase of 21.6 percent over Pol I) and an oil content of 50.2 percent. Its per hectare yield is 1165 kg of kernals and 585 kg of oil compared to 903 kg of kernels and 450 kg oil of Pol I. Above all its dormancy of 96.8 percent of the seeds for 15-days after maturity (compared to 68.5 percent of Pol I) makes it much safer when there are harvest rains and

the danger of germination of pods. It is now in use as Pol-2. In groundnut, the State leads in technological innovation and its ready adoption by the farmer. In a comparative nine region study, it was found that whereas the average coefficient of adjustment of prices and technologies to production is 6 to 8 years, in this State it is 2-3 years for full adjustment, due to the higher technological level of groundnut cultivation. The policy conclusions of the study include common price policies for the State as a whole, (not setting varied prices for South Arcot or Ramanathapuram,) and that post harvest prices are the means of influencing production in the direction desired. Tamil Nadu's experience is that price policy has significance in the contest of agricultural modernisation and technology and if prices encourage adoption of better practices, increased output is obtained more through variations in production technology than in expansion of acreage.

Irrigation: The programme of canal lining suggested in the last issue of the Bulletin, is to be put into operation with the Rs. 13 crore project starting this year. This 4 year programme (1972-76) will complete the repairs, lining and renovation of the Cauvery Delta irrigation system. For the year, the legislature has also voted Rs. 3 crores special minor irrigation works which are immediately productive and employment generating. Studies are being undertaken as to the feasibility of the Rs. 212 lakh flood control barrage at the upper anicut of the Cauvery and the sea wall to prevent sea erosion of agricultural lands in the Kanyakumari district. To strengthen and improve the State's irrigation programmes a Research Centre in Aduthurai in Thanjavur district (which is also the research demonstration site for irrigated pulses) is being established. It will undertake a long range agronomic and agro engineering study with a view to promoting better water management and crop production in the State. The question of irrigation finance now becomes important with the completion of major irrigation wants and the sound development of minor irrigation in the State. The irrigation cess in the State needs to be reviewed in light of recent agricultural developments and the needs of irrigation finance. Through minor irrigation works it should be possible to double the irrigated area in the State over 2 Plan periods, provided the financing is assured through self financing measures in great part.

Fertiliser inputs: The use of fertilisers in the IAAP and IADP and other high yielding food and horticulture production raises four sets of problems. The first is the shortage of fertiliser supply in relation to the optimum input demand in the next 3 years. Now in the IAAP and IADP areas, the 150 percent intensified cultivation must move up to 200 percent by 1976. But the current fertiliser supply of 35 kg N, 9·5 kg $P_2 05$ and 15.5 kg K.20 per hectare will remain unchanged in 1976 except for a 1/3 increase in the N. This short fall in fertiliser supply therefore calls for first economising in fertiliser use by matching fertiliser input with soil test values in order solely to make up for soil deficiencies in each farm. In our rice growing areas which use the costliest fertiliser, nitrogen in the ammoniacal form, the input can be economised by using coated urea, or urea mixed with neem or pungan. Similarly superphosphate coated with cowdung, rock phosphate on acid soils or using varieties which make fuller and better use of fertilisers as the Wellington station has demonstrated are further measures of economy in the use of fertilisers which will continue to remain in short supply. Second there is need for adaptive research on some six major fertiliser uses which include rock phosphate doses for acid soils, split application of nitrogen, plant rootings and their absorption of phosphorous, aerial vrs. power spraying, use of coated area etc. A third somewhat contrary problem is the declining farmers demand

for fertilisers. This is due to the fact that the fertiliser input is the largest component of the farmer's total cost of production. Hence with the rising cost of fertilisers (and 15 percent budget levy for the current year will further push up fertiliser cost) and the decline in its quality, the farmer is on the lookout for saving on this important element of his production input. Increasing use of farm wastes and other traditional soil nutrients are being resorted to by the farmer to cut down his fertiliser bill. The fertiliser companies face a buyers' market as they have no alternative outlets. Hence given the stakes of the State and Country in the area of production, there is need to stop the process of price escalation. As pointed out in the last issue of the Bulletin, when the Raj Committee recommendations are available and agricultural surplus incomes are taxes, this regressive tax on fertilisers should be withdrawn. Equally the companies should also take all necessary precautions against adulteration and provide technical help to the farmer in the optimum use of the fertiliser supply. The March agreement of the Madras Fertilisers limited with the Thanjavur Co-operative Marketing Federation to market the Manali Plant's fertilisers is a much needed step. The co-operative will distribute the fertllisers to the farmers through its retail outlets. MFL has entered into similar agreements with the cooperative Fertilisers in Kerala and Pondicherry. The State also can help through a strict emforcement of the Fertiliser Control Order, through attaching a fertiliser inspector in each DAO office, through maintaining a flying squad for surprise checks and through using the testing centres at Madurai and Coimbatore as well as all other centres such as the soil testing centres, mobile units in the State to test samples quickly and insure their quality. The fourth problem is the related one of the effect of fertiliser use on human and animal health in the State and Country. In the developed countries laws are being enacted to control the maximum quantities of residual toxins in flour, fruits and vegetables, because the use of pesticides and insecticides have seriously contaminated flour, fruits, vegetables and milk. In our country the death of several Punjab buffaloes after eating IR-8 paddy straw is a serious warning of the dangers of fertiliser use referred to in Vol. II No.1 of the Bulletin. What is needed urgently in the State and Country is education of farmer and legislation. Farmers using chemicals on food crops, market gardens, fruit orchards should be educated on the poison in the chemicals they use, that they must wait for a week after spraying the crops before harvesting the produce and so on. This is the task of the extension worker. In addition the State should enact laws as to the limits of permissible residuary chemicals to be found in farm produce and set up the necessary research and testing facilities to help enforce the legislation.

Infrastructure: The States agricultural infrastructure is being renovated and expanded. The Agricultural Productivity Council for the State for working on agricultural productivity problems and increasing and improving productivity, has been established. The Council will train agricultural specialists and workers at varying levels of skills, organise development and research programmes and accelerate the use of scientific technology in agriculture. The Council will also provide farm consultancy service. This innovation will be an important instrument in achieving the increased targets for paddy, cotton, pulses and oil seeds that the State has set for the current year. Another important infrastructural programme is the examination of a crop insurance scheme that is based on the experiments and studies that are being conducted in Coimbatore on cropping patterns, production cycles, failures and bumper crops. The results of the experiment will be analysed and computed this year, so that the crop insurance programme can be formulated next year. The Food Corporation of India has opened a permanent commodity sales

centre in Madras (and will soon be extending such centres to the other urban areas of the State) for the sale of grains, pulses, dals, oilseeds and oils. As a counterpart to the major function of supporting farm prices and handling procurement of a growing variety of farm products, the FCI will now have sales outlets, wholesale and retail, in the State capital and other urban centres. This will help to stabilise prices and close the gap between the price paid to the farmer and that charged to the consumer. Another important infrastructural facility is the establishment and functioning of the institutions to help the small farmer and the marginal farmer with improved technology, supply of inputs and solutions to fragmented holdings. In the State the Small Farmers Development Agency (SFDA) has begun functioning in three areas and Marginal Farmers Agricultural Labour (MFAL) in two areas. Both programmes have begun providing important services to the small and marginal farmers with credit and other inputs, and the processing and marketing of products. In addition, for the marginal farmers the agency provides subsidiary occupations and employment opportunities. One other development should be noted. The State Bank of India has decided to execute a long term agricultural investment programme of Rs. 150 crores through 150 " intensive centres", at each of which an Agricultural Development Branch supported by technical and other field staff will be established. These centres will be established where SFAD and MFAL and other small farmers programmes are running. 67 such centres have been identified, 33 Agricultural Development branches approved and 22 opened. Each branch will provide agricultural finance to meet the assessed needs of a cluster of villages. The objective is the major aim, of bank nationalisation: to find out how best the Bank's credit should be invested in the cluster so that surplus incomes for the farmers are created with which they can repay the loan, raise their living levels and that of their villages. The Finance needed by each Branch is Rs. 2 crores which is scaled down to Rs. 1 crore to start with. The long term nature of this operation calls for support by the Agricultural Refinance Corporation, which will also give a second expert opinion on the schemes. The programme will also work out relations with cooperative banks, demarcate areas of operations and help in developing State legislation, so that other commercial banks can enter this field. Outside of this intensive centres programmes, the ongoing crop loans schemes and village adoption scheme under which 2400 villages have been adopted are other facets of agricultural financing of the State Bank group. It is now for the State to take full advantage of these credit facilities and for this department of Finance under the Chief Minister can act as the credit coordinating and promoting agent for the State.

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Industrial Progress :

Annual State review: The two goverment publications on major industries and industrial finance for 1971-72 record satisfactory progress. All indicators concerning major industries are positive. Plan outlays have increased from Rs. 1.53 crores in the First Plan to Rs. 64 crores in the Fourth plan, from Rs. 5.20 lakhs on 1969-70 to Rs. 8.83 lakhs in 1972-73 : industrial production index has increased steadily from 54 in 1951 to 172.8 in 1970 and 189 in 1971: factories have increased from 6,365 in 1970 to 6412 in 1971 employing 4.23 lakhs of workers: imports into Tamil Nadu Ports were Rs. 190.2 crores and exports Rs. 140.6 crores: industrial power consumption has increased from 560 million units in 1951 to 908 million in 1961 and 2730 million units in 1971. 53

industrial licenses and 71 letters of intent have been issued in 1971—a 200 percent jump over 1970. 17 foreign collaboration agreements have been approved in 1971. 19 capital issues for Rs. 4.24 crores were issued in 1970. The analysis of the 10 important Central Sector Projects shows similar advance—Neyveli Lignite Corporations, Integral Coach factory, Heavy Vehicles factory, Hindustan Teleprinters, Hindustan Photo Films, Bharat Heavy Electricals, Tube Blending, Salem Steel, Madras Refineries, and Madras Fertilisers. The four State sector projects—Tamil Nadu Cements, continuous Casting Plant and Nylon textile filament yarn Plant operated by TIDCO and the Mechanised Brick Plant have started well. 14 projects, most of them in the planning stage, in the joint sector are reviewed SPIC, Soda Ash, Tyre and Tubes, Cigarettes, BCT Powder, potassium chlorate, Borax and Boric Acid, Calcium Carbide, steering gears, Sodium hydrosulphite Precision measuring instruments, Aluminium, Cigarette tissue and Naphtha cracker. 3 private sector companies—Carbon Block, Nagpal Ambadi and Nylon tyre are reviewed. The other volume on Industrial finance in 1971-72 breathes a similar air of optimism and sound achievement. First, the five all India financial institutions, IDBI, IFCI, ICICI, LIC and Commercial Banks, have loaned industries in the State Rs. 186.49 crores upto 1970, being 11.8 percent of their all India investment. Tamil Nadu Industrial Corporation granted different types of loans amounting to Rs. 3.25 crores in 1970-71 and for small industries differential interest rates, security conditions and special schemes for technicians and medical practitioners and backward areas. So too the Tamil Nadu State Co-operative Bank, the Industrial Co-operative Bank, Tamil Nadu Handloom Finance and Trading Corporation, SIDCO and SIPCOT have provided or planned to provide financial aid to industries ranging from Rs. 31 lakhs in the case of TIIC to Rs. 36 lakhs in ICB.

The two reports record the positive achievements in industrialisation and finance—which are important and creditable. But they provide no basis for action. The trend and tone of reports presented to the legislature picture the achievements in every sector. The problems faced, the obstacles encountered, the policies which have not worked and needed to be revised, the projects which have proved to be of lower priority—on none of these is there any analysis. The paean of praise needs to be balanced by a critical analysis, if the reports are to be more than a mere accounting of resources made available. The industries reviewed in the report have been the subject of some analysis in the past issue of the Bulletin. This issue will also refer to some. Such a critical review is the only basis for deciding on strategies, renovated policies and where we go next. The rapid increase of industrial consumption of power, together with the near completion of the rural electrification programme, the energisation of pump sets, the electrification replacing steam and diesel in the railways are a positive achievement. But together they add up to a very serious problem of power scarcity in the State for the future. It is against this total picture that the four further future sources of power supply, the second mine cut at Neyveli, the proposal for an Atomic Power Station in the Southern region, the several small thermal proposals and the borrowing from neighbouring states must be reviewed. Between these four lines, the time element may well be the decisive factor and on that basis thermal generation near the sea coast seems to be indicated. The problems faced by Salem Steel and Arkonam Casting Plants as well as Neyveli should be fully analysed both to help their programmes and point to the future. The problem of industrial peace and its relation to the State's industrialisation Programme and the related activities of SICOM to attract Tamil Nadu industries to Maharashtra offering them all the inducements from assistance with obtaining licenses and finance to the preparation of feasibility studies should be fully discussed.

To what extent is SIPCOT able to counter these trends and what assistance it needs not only to help retain existing firms but promote expension, innovation and penetration into un-industrial areas of State? What relation does such a programme have to the industrial financial potential available to the State? These are some of the issues which future reports should concentrate on : There is no need to open our reports with the somewhat naive and misleading justification of industrialisation vrs. the so called limits of agriculture in the State. The opening should rather refer to the mutual reinforcing of the two sectors, their being parts of a single system and in what manner this systems relationship of our industries and our agriculture is expressed. Finally rather than apologising for dealing with only 3 private firms, future reports should provide a comprehensive census and analysis of the private sector in the State on which no information anywhere is available. The Planning Commission working on the 12 year Perspective Plan and the Department of Finance on the Fifth Plan are groping in the dark on the private sector's precise role and the nature and quantum of its contribution to the State economy.

Salem Steel and Arkonam Concast : The provision in the National Budget of Rs. 7 crores under equity and Rs. 1 crore as loan to prepare Salem and the other two Steel Plants referred to in the last issue of the Bulletin has resulted in completing the Karanjimalai land acquisition programme. As the major industries report points out, the State Government had notified about 1300 land owners in 1964 that it will be acquiring 24,446 acres for the Steel Plant. Later this was reduced to 16,845 acres. By the end of March 600 acres and by the end of April 755 acres have been acquired and handed over to the Union Government for erection of the plant. In the course of March and April, some Rs. 70 lakhs has been paid to the land owners, raising two problems. The farmers need to be helped in acquiring new lands, occupation and settlement. The steel Plant has made available 200 acres for house sites of the displaced farmers. The State Departments of agriculture, small industries and Khadi Board should help the farmers in finding alternative occupations and lands. Branch banks and co-operative institutions in the area should attract this large sum now available to the farmers and turn them into deposits and savings accounts. The Railways have finalised Plans for realignment of the railway track, building the marshalling yard and siding and is starting work on them. As Salem Steel will now specialise in producing 2.5 lakh tonnes of stainless steel, the State project for a stainless steel plant in the joint sector has been wisely shelved.

The annual major industries report is incomplete in describing the progress and problems of the Arkonam Continuing Casting Plant (Concast) under TIDCO and assisted by the Soviet collaborators. The annual report seems to refer to plans and hopes, as did Vol. I No. 10 issue of the Bulletin. This important plant faced many problems which has led to a serious delay in its going into operation and to several modifications, due to faulty planning including not foreseeing certain bottlenecks. First the produced output of 100,000 tonnes of 100 MM billets could not be produced by the one scrap based 25 tonne electric arc furnace. Its limited melting capacity has now been recognised and a second 25 tonne arc furnance with 12 MVA transformer (and not the 9 MVA) is now on order by TIDCO. Each furnace can only produce 50,000 tonnes. Second the radio active isotope sensors which control the rate of casting were considerably delayed in delivery, has had to be airfreighted from Moscow and recharged at the Atomic Energy Commission in Bombay. Third the heavy Voltage fluctuations have made continuous plant operations risky and so operations are to be restricted to a six hour daily time period

(from 10 a.m. to 4 p.m.), along with the installation of stabilisers which are now on order. Fourth the project has had to be run on a trial basis in billets production for all of March and most of April, before it could be put into commercial production of first 30,000 and later its 50,000 tonnes capacity. Fifth the delay and other factors referred to above have raised the cost of project (Rs. 8 crores) by 25 percent and raise doubts about the competitive nature of the billets. Hence the surplus heat in the furance is being utilised for slab casting and some of the slabs are now on the market. Finally the 13 tonnes of scrap which were accumulated due to the delay are now expected to be used in 3 or 4 months and hence a continuous supply of scrap from all neighbouring sources is now a priority. Being the first highly automated four strand concast with closed circuit TV installed in India, none of these problems is surprising and their careful study will ensure that future sophisticated projects will be planned in light of the lessons learnt from this enterprise.

Karaikudi's Electrolytic magnesium plant: Magnesium is not produced in the country and is imported. The raw materials for its production are magnesite available in Salem, sea bitterns available in Tuticorin and dolomite also available in the country. The Central Electro-Chemical Research Institute since its start in 1953 has developed 74 electro-chemical processes of which 40 have been released to industry, involving a total production of Rs. 105 lakhs, with a foreign exchange saving of Rs 90 lakhs. With this background, the State Government and CSIR have financed at the Karaikudi institute, a Rs. 22.28 lakh pilot plant to produce magnesium. The 250 kg per day pilot plant has started production of electrolytic magnesium, its first 10,000 ampule producing 1.5 tonnes per month, going on to 6 tonnes per month this month. The pilot plant will be completed by March 1973 and at that time the technology for a plant producing 600 tonnes of magnesium per annum can be set up. This is a case of a viable import substitution as the cost of production or a plant of one tonne day capacity will be a little lower than the imported price of the metal. The Magnesium is in growing demand as a light metal which with aluminium forms a very useful alloy of lightness, strength with resistance to all forms of corrosion. Among the Karaikudi Institute's contribution of the State and Country are its protective shields for steel and other radiators. cadmium sulphide cells used in automatic street lighting, hard chrome plating of piston rods, tantulum capacitors, copper plating of stainless steel, use of iron powder in welding electrodes, production of manganese dioxide, anodic phosphating and electrolytic aluminium capacitors for the electronics industry. The Karaikudi Institute provides a consultancy service to the industries who use its processes and is a good example of the application of R and D in the industrial processes and potential of the State and Country. That is one of the objectives of the reorganisation of the CSIR Institutes that was recently undertaken. Its relation with industries in the State is mutually beneficial and reinforcing.

Small industries: The major industries annual report by definition does not report on small Industries in the State, with which they are closely linked and should be further. In fact the Japanese experience is well known to us that our major and medium industries could obtain all their components and requirements from small industries. That also is the main lesson as it applies to this State from a reading of the very readable Bolton report on small firms that was published in the United Kingdom at the end of last year. Our small Industries Service Institute and corporation provide good technical and

financial services to small industries. Small industries will now take advantage of concessional finance offered to them if they start enterprises in the industrially backward districts: South Arcot, North Arcot, Dharmapuri, Tiruchirapalli, Thanjavur, Ramanathapuram, Madurai, and Kanyakumari. The State and Centre have also declared 50 taluks within these districts industrially backward and offer 10 percent capital subsidy, 15 percent reduction inpower tariff etc. What is further needed is a more integrated policy towards the small industries sector which will pull together all these facilities and the new institutions of commercial estates and growth centres which are being planned.

One small industry now under study is paper production through blended use of Pulichi and Agathi wood. The project will help the farmers who cultivate the raw material crop, Kenaf, and sesbania, and paper needs of the State will be met a little more adequately. This is a project in the co-operative sector and managerial resources are needed to plan carefully and well ahead the pulp ingredients, their systematic and massive cultivation to ensure a regular and uninterruped supply. It is not resources that will be lacking for this important employment-income generating project which can be placed in an industrially backward area. It is project planning and execution which is the desiderata.

Tamil Nadu Rubber Limited, a joint sector project, under TIDCO is establishing in Kariyur, Ramanathapuram a Rs. 5.5 crores plant for manufacture of 300,000 tyres and tubes per annum, as referred to in Vol I No. 3 of the Bulletin and confirmed in the Annual report on major industries. TIDCO is investing Rs. 25 lakhs, the private sector Rs. 75 lakhs and the equity capital will be Rs. 2 crores. In the first stage the plant will produce tyres and tubes for lorries and buses and later cycle tubes. The raw material used will be imported Malaysian rubber. The growing transport network in the State will now have a steady supply of tyres and tubes. Tamil Nadu Small Industries Corporation (TANSI) is setting up a Rs. 45 lakhs factory in Madras to manufacture 30,000 mopeds per annum. Using the existing facilities of TANSI's tool room and foundry shop and 100 percent indigenous material, the plant which will start production in September will produce 100 mopeds this year and gradually expand its production till in 1980 it will produce 30,000 units annually. Its costs being low, this production initiative will help keep down the price of this article of wide consumption. Hindustan Teleprinters will be expanding its operations by Rs. 4.77 lakhs to produce 500 electric typewriters per annum. This programme will meet in part the rapidly growing demand in government and business for this facility. The year end accounts show a loss of Rs. 15 lakhs of the Khadi and Village Industries Board mainly due to the Rs. 70 lakhs loss suffered by the Khadi section. It is necessary now to modernise Khadi operations and introduce the 12 spindle power driven Charka both to eliminate losses and lessen the physical effort of the spinners. The handloom and textile account on the other hand show that the cooptex has turned the corner (its loss last year was Rs. 33 lakhs) and registers a profit of Rs. 8 lakhs. This is due to improved production and sales distribution. Re. 1 lakh of new design handloom shirts suited to foreign tastes have been sold in the United Kingdom and a further order of Rs. 6 lakhs has been received. The distribution net work has been strengthened by the opening of a cooptex supermarket at Kuralagam and at Vellore, Madurai and Nagercoil. This is an important foreign exchange earner and needs similar outlets in the enlarged Common Market. The Tamil Nadu Housing Board Cellular Concrete Plant at Ennore has completed its first stage of production. This first stage cost of Rs. 2.96 crores is now expanded by a further Rs. 7 lakhs to enable it to move into the second stage of production to meet

the growing building programme of the Housing Board and other demands for cellular concrete. In addition to the Korattur neighbourhood project (Rs. 2.38 crores), six schemes are under consideration at a total cost of Rs. 15.20 crores.

Another important State initiative is the establishment this year of the State Industries Promotion corporation (SIPCOT) to encourage and promote initiatives and programmes by industrial entrepreneures to quicken the pace of industrialisation and ensure dispersal of industries in backward areas, taking advantages of all the facilities and concessional finance for operating in these areas referred to earlier. In addition, SIPCOT has developed two new and somewhat original schemes to help industrialists taking these initiatives. First it will bring together a group of commercial banks in a consortium to advance 50 percent of the block capital of a project. Second it has worked out a credit guarantee scheme under which SIPCOT will guarantee the bank loans made to the industrialist for the creation of fixed assets. Under this programme it has extended *existence to four private sector medium scale industries.* A DOP plasticiser project (Rs. 40 lakhs) and a plant for vialling bulk penicillin (Rs. 27 lakhs) is being set up in Ambattur. The motor cycle spare parts plants (Rs. 47 lakhs) are being set up in Ramanathapuram. In addition SIPCOT will aid forthcoming industrials with the preparation of project profiles, feasibility reports and more generally all information they need from a data bank which will be developed.

Minerals : The Annual review of the State geological departments reports important mineral prospects. In the Tiruchendur coastal area deposits of ilmenite have been located and further investigation of beach sands from Tiruchendur to the Ramanathapuram coast should now be undertaken to determine its extent and viability. Similarly garnet sands have been located between the Nambiar river delta and Overi village and further exploration through sinking auger holes should be carried out. Other mineral surveys indicated are Sirumalai Hills (Madurai district), Guttiyalathur (Coimbatore), Pachamalai (Thiruchirapalli district), white clay near Nagercoil, zircon and apatite in Vilvancode, high grade limestones in coralline reefs (Tiruchirapalli district), and oil exploration in Kattumannarkoil. In addition there should be testing of bulk samples of Tiruvannamalai iron ore. At least two of the surveys—ilmenite and iron ore should lead to processing plants in these districts during the Fifth Plan.

Minor Ports : The Annual report on major industries reports the growing import and export trade through the State's major ports. The cargo traffic passing through the State's 7 minor ports and three intermediate ports, Cuddalore, Nagapattinam and *Tuticorin show* a continuing and steep decline—by over 40 percent between 1962-63 and 1970-71. The cargo volume declined from 15·60 lakh tonnes to 9 20 lakh tonnes, the sharpest fall being in Cuddalore from 4·6 lakh tonnes to 1·7 lakh tonnes. Two minor ports-Porto NOVO and Dhanushkodi—have been closed. Apart from such rationalising and coordinating action, port facilities and handling have to be expanded and improved to reverse this declining trend. The Cuddalore port development scheme costing Rs. 191 lakhs and aided 50 percent by the Centre should be completed this year and should help in expanding its traffic. The Rs. 24·4 crores four berth deep sea harbour in Tuticorin which will move it into the major port category in the State should be completed next year. To help the import needs of the fertiliser complex (SPIC), it should complete work on 2 berths as early as possible.

Finally the Rs. 40 crores Sethusamudram project now awaiting Central approval, which will shorten the sea route between the Country's east and west coasts through connecting the gulf of Mannar with Palk straits should be put in hand soon. In foreign exchange alone the project will earn Rs. 1·7 crores annually and will step up the port trade of State and Country significantly.

Private Sector: A broad canvas has been traced to regenerate industrial growth in the private and public sector in the annual report of ICICI. For this the planning objective is fairly simple: to adjust the demand for goods to the resources available in the economy, so as to maximise growth and resource utilisation. To attain this objective, the strategy should be to stimulate demand in industries having excess capacity, to run public and private sector industries with such unused capacity efficiently, and to expand capacity where shortages appear—all of which adds up—not to the plea for more resources, but for efficient managerial capacity. Against this immediate strategy, the medium policy should be based on defined rates of growth of industry and agriculture (the former being double that of the latter) the development of industry on the basis of our generously available resources in iron ore, beauscite and coal which should be the lead sectors, the definition of an energy policy which balances solid, liquid and nuclear fuels and the establishment of a transport policy which gives priority to road transport because of its multiplier effect on employment. The private sector's opportunity to play its role in the growth sectors—electronics, petrochemicals, automobiles, and sophisticated industries—should be seized, given the economy's comparative advantage in resources, material and human, and design and fabrication facilities.

Against these imperatives, the annual reports of the private sector firms make mixed reading. Madurai Mills reports a one third fall in trading profits for 1971 compared to 1970, due to high raw materials costs, and interest charges on inventories. Sales were 17 percent higher, though exports declined to Rs. 6.18 crores. To improve future productivity and quality, the rehabilitation and modernisation programme of the spinning mills have been continued, the expansion of 100 industrial and 400 civil looms undertaken, Pandyan Mill manufacturing restarted, the finishing unit capacity at Ambasamudram increased, and a caustic soda recovery plant added. A five year labour contract was negotiated with the union, a family planning clinic with special incentive started and schemes of management development initiated. In this regard the results of the innovative approach—Management by objectives initiated by the mill should be followed with interest by other private sector firms which stand in need of similar innovation. Tube Investment also reports problems of raw material supply and cost but through changes in the pattern of production and intensive sales have avoided sharp reductions in turnover and profits. Despite a short term dip in the demand for tubes from the cycles industry, a higher level of output all round except in the cycles division was maintained. Now with the pick up of cycle demand, a third tube mill is to go into production, Kothari Madras, having completed legal proceedings has now put into effect its merger scheme. The income of the concerned companies are now merged back to September 1969 and the accounts of the new company are awaited with interest. Dunlop's report for 1971 shows a record output for 1971 as a result of the expanded facilities of Ambattur and the improved power availability. Labour disputes and power shortages in the first part of 1971 are unfortunately repeating themselves this year in this plant with its production potential and importance. Madras Rubber Factory which faced a long period of labour

unrest in 1971 records a 40 percent turnover. Its expansion programme from 3.6 lakhs sets of tyres and tubes to 6.1 lakhs sets has been attained and through its R and D efforts, the machinery needed has been locally fabricated, saving considerable foreign exchange. It should continue its import substitution programme to replace completely the residual technological import.

Industrial Relations : After the troubled labour situation reported in the last issue of the Bulletin, a considerable degree of industrial peace has turned to the State. All units of the Simpson group have reopened and the workers are back at work; the textile mills are functioning once more, the teachers, NGOS, banian workers and others have withdrawn their strikes and are back at work. There is a lock out in Dunlop and some agitation on the use of computers in government accounting and budgetting. The cost of the labour unrest for the State has been heavy. There were 308 strikes and lock outs, with 22.8 lakhs man days lost in 1971, against 277 and 10.3 lakhs in 1970, according to the State Department of labour. The Simpson strike cost the company Rs. 15 crores in loss of production, and the country (there is not one automobile plant which does not use a Simpson product) lost Rs. 80 crores in production. The loss to the State and the mills of the textile strike was referred to in the last issue. There is here a further frustration in the textile mills situation. The reopening of the closed mills have been the result of prolonged study by specialists from the National and State Textile Corporations. The take over has involved financing of the capital needs by the State Government and the National Textile Corporation and the provision of a part of the working capital requirements by the nationalised banks. Now delays and difficulties are being encountered in securing bank finance and some of the reopened mills are running out of stocks and face closing down again. While for the present, pressure from the Centre and State should be brought on the Bank to play their part, in the future the banks should be brought in at the earlier stage of examination and investigation of sick units, so that they know the background and details of their potential clients. No one likes to be presented with a settled fact and the banks have a responsibility which they should be able conscientiously to discharge.

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EMPLOYMENT :

There is a general uneasy feeling that unemployment in the urban areas and among the educated and under employment among the rural peoples are on the increase in the State and the Country. One of the first tasks is to undertake a computation by district, by occupation, by age and by sex of the actual magnitudes of unemployment and under employment. That was one of the requests made by the Chief Minister, as chairman, when he discussed the State Perspective Plan Frame with the Planning Commission. Precise information might be collected from 2 or 3 districts in the State in order to know the size and nature of the problem. At present we have no more than indicators. The perspective Plan Frame computes that there are 12 lakhs unemployed in the State on the basis of NSS surveys, pro-rating all India figures etc. No computation of the extent of under employment in Tamil Nadu has been attempted. The latest all India employment exchange figures show that number of job seekers has increased from 34.24 lakhs in 1969 to 51 lakhs in 1971 and the number educated job-seekers has increased from 15.26 lakhs in 1969 to 22.96 lakhs in 1971 of whom, according to the 1961 census and 1968 national

register maintained by CSIR, 75,000 are scientists. Apart from the scientists figure, the other employment exchange figures give no indication of the nature and extent of unemployment. Not allunemployed register, not all who register are unemployed. NSS and census surveys show a very low unemployment rate averaging 2-3 percent of the population, mainly because of definitional limitations clearly outlined by the Dantwala committee. The report of the Rural Enquiry Committee which shows that the average number of full days of employment in the rural areas was 272 for men and 183 for women, that the average duration of enforced unemployment was 47 days for men, 97 days for women and 51 days for children may also be misleading because of its aggregative and undifferentiated computation. And so we are here on the horns of a dilemma. We cannot prescribe a programme until we know the nature and extent of the problem.

And the fact is that at neither the State level nor the All India level do we have the kind of detailed information on unemployment and under employment recommended 3 years ago by the Dantwala Committee. And yet unemployment is a grave and urgent human problem and cannot wait till surveys have been completed and information analysed. The husband is unemployed now; the wife and children have no food or money for kerosene or clothes now. It is this kind of situation that has led to the Rs. 67 5 crores for SFDA, Rs. 47.5 crores for MFAL, the Rs. 50 crores crash programme against unemployment. That the programmes have not functioned smoothly or in some cases not started can be, in part, attributed to prescribing the remedy before knowing the details of the disease and the adhoc nature of the programmes—not being part of an intergrated plan. It is one thing to set forth general conceptions as the first seminar of the Madras Institute of Development Studies did in its conclusion: "The real challenge that India faces is to bring about the many institutional and economic transformations in and around agriculture where most of the enlarged labour force must be employed. There is every reason to believe that if the necessary adjustments and transformations can be carried out, larger labour inputs will yield constant or even increasing returns. India has no option but to proceed on this assumption". The ECAFE annual survey also pointing to unemployment and under employment in the region continuing at intolerably high levels recommends slow down of agricultural mechanisation and tractorisation and the use of labour intensive techniques in investment programmes. When these generalities are translated into programmes, more precise information on the employment situation is needed, together with names of integrating programmes with National or State plans so that durable assets and employment are valid. That at least was the main lesson of the February seminar on the crash employment scheme. Continuity of employment in project works, durability of assets conforming to the accepted standard specifications, integrating the scheme with the backward areas programmes in each State, as well administrative improvements were suggested to make the programme employment generating.

In the State in addition to the special schemes for medical graduates, teacher graduates and the youth corps referred to in Vol. I No. 7 and Vol II No. 3 of the Bulletin, the further programme for the educated unemployed launched in February include, Rs. 12.5 lakhs as seed capital to technician entrepreneures to meet half the margin required by financial institutions: Rs. 3 lakhs for the technician cooperatives: Rs. 5 lakhs for running twin blocks at the commercial estates in Ambattur, Vyasarpadi, Madurai, Ariamangalam, Vellore, Karaikudi, Salem, Nagercoil, Thanjavur, Pettai, and Vridhachalam for running service centres for scooters, motorcycles, radios, electric motors,

pumpsets and appliances etc. 24 sheds at Ambattur for technician centres and a hire purchase service through SIDCO at a cost of Rs. 27.5 lakhs.

A further programme to deal with rural unemployment is proposed in the interim report of the (Bhagwati) Unemployment Commission. Its 29 recommendations are drawn from existing programmes in the Fourth Plan and call for an intensified effort on each during the 2 remaining years of the Plan. They may be grouped under five heads: (a) minor irrigation with the existing outlay of Rs. 575 crores plus Rs. 100 crores which will provide employment for 27.5 lakhs unskilled workers and 4.5 lakhs of skilled workers: (b) rural electrification with the existing outlay of Rs. 90 crores plus Rs. 235 crores (c) road and water transport with an existing outlay of Rs. 477 crores plus Rs. 110 crores: (d) rural housing with an additional outlay of Rs. 230 crores providing employment for 1.3 lakhs unskilled and 67,000 skilled workers: (e) rural water supply with an existing outlay of Rs. 51 crores plus Rs. 65 crores providing employment to 44,000 unskilled workers and 8,000 engineers; and (f) a programme of primary education with the existing outlay of Rs. 130 crores which will provide employment to 2.8 lakh teachers. Thus a total investment of Rs. 2063 crores is proposed, of which Rs. 1323 exists in the last two years of the Fourth Plan. The additional outlay of Rs. 740 crores is to be raised through taxes (Rs. 280 crores), Banks and LIC (Rs. 280 crores) and private investment (Rs. 180 crores). The report has been somewhat harshly brushed aside by economists and economic journals. Rs. 2000 crores for providing employment for 40 lakh persons seems on the high side. Further the aggregative estimates need to be broken down and worked out more precisely. The programme of minor irrigation, rural electrification and housing are not labour intensive. In the case of the first two programmes, they can be made that, while rural water supply and rural housing have their own high priority in any anti-poverty programme. The employment generating nature of education may be at the cost of its quality and skill adaptation. The merit of these interim proposals is they are part of the State Plans and over 7/10 of the finance is already provided. Some of the recommendations for raising revenue through a levy on commercial advertising and rural taxation should be examined. The proposals for employment surcharges on incomes—personal and corporate—are unlikely to be accepted given the diminishing returns that the present rates encounter a la Wanchoo committee. But the resources picture can be clarified and firmly established as a decision is made on the five programmes-each of which is part of the attack against mass poverty, is growth inducing and also employment generating.

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Education and Science :

State Educational Plan and Educational Progress : The State Planning Commission's Task Force on education, science and technology received at the end of April the reports of its four working groups on; School Education. Science and Technology, Higher Education and Adult Education. In addition, it has received a report on dropouts and stagnation in one rural and urban school area, a report on the economic profile of all students in one rural and one urban institution from the directorates of School, Collegiate and Technical education and a report on educational management and administration in Tamil Nadu undertaken by the Hyderabad Staff College and financed by the National Staff College and the State government. The stage is now set for the Task Force to

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finalise its report on the Education and Science Perspective Plan for Tamil Nadu. A meeting of vice-chancellors of Southern universities in March has expressed its preference for a two year intermediate and three year degree course. The State government has decided to take over 129 municipal high schools, starting with a take over 25 schools this year which are in bad shape and in response to the desire of local bodies to be relieved of their educational responsibility. This is educationally not sound as education is an individual local process and is against accepted pedagogic trends, which are aimed at giving greater autonomy to the institutions. School facilities are to be expanded with the introduction of a pilot project for eye examination of school children in Madurai at a recurring cost of Rs. 45,200 per year and a non-recurring expenditure of Rs. 34,100. The Madras University 'earn while you learn' and vacation jobs schemes are developing well. Over 200 students have been provided with part time employment in various firms and offices and 60 students have been placed on Sundays and holidays jobs in the University library. Vol. II No. 1 of the Bulletin called attention to the need for developing widely this facility as a means of making higher education more purposeful and opening the door to the poorer sections in the State. This start needs now to be widened and followed up. Parallel to the discussion in the Lok sabha referred to in Vol. II No. I of the Bulletin, the State Assembly debated a private members' bill to provide student representation in the Madras University. The government's position is that college students should be given representation on university bodies in matters of administration and management concerning them, and that a consultation with the Vice-Chancellor of the Madras, Madurai, and Annamalai Universities will be needed to evolve a scheme. Any such programme must apply to all the universities in the State.

Technical education : A review of Technical education show that for the Country, the Central sector outlay of Rs. 67 crores in the Fourth Plan is being expended (in the first 3 years Rs. 45·87 crores have been spent), while of the Rs. 57.44 crores in the State sector only Rs. 21.75 have been expended. There are many reasons for this lag. There has been the problem of the unemployment of engineers. The latest forecast of the Institute of Applied manpower Research is that there is a serious problem of employment of metallurgists. By 1973-74 there will be 6806 metallurgists against a demand of 2000 and by 1978-79 the supply will be 8390 against a demand of 2752. But this is no reason for slowing down technical education. What is needed is changing the specialities and levels. For, metallurgy diploma holders will be in very short supply. In 1973-74 the demand will be 2492 and supply 1211 and in 1978-79, if present admission trends are not changed, it will worsen to 3245 demand and 1805 supply. In other words, there is need for a policy to relate technical education programmes flexibly to manpower forecasting, Another reason for the slow down is that the Damodaran Committee recommendation to allow greater autonomy to polytechnics and engineering colleges, both to speed their operations and allow them to develop close relations with local industries through sandwich courses and consultancy services, have not been acted upon. The States Perspective Plan will, it is hoped, propose a policy and programme for speeding and making effective technical education in the State.

Museums: Museums are an educational tool and a science education instrument. The proposal to establish at Thirumal Nayak Mahal in Madurai a museum for the Southern region in the State is a move in the right direction. In the same manner it is necessary for

the government to modernise the Madras Museum, develop a Children's museum section in it, improve its display and preserve its rare and valuable collection with simple freeze dry equipment. The Museum should also develop a mobile section to carry its educational and scientific message to the rural areas. It is also a foreign exchange earner in that every tourist visits it. Its modernisation and extension must be provided and will not need more than Rs. 15 lakhs.

Medical education: The State Planning Commission's Task Force on Health, Nutrition and Sanitation is considering the reports of its seven working groups with a view to finalising its Perspective Plan report. The group reports are on Medical Services, Family Planning, Voluntary Services, Indigenous Medicine, Nutrition, Sanitation and drainage and Medical education. Meanwhile, the Madras university has introduced two new branches in MD in social and preventive medicine and haematology in response to the growing problems of pollution, malnutrition and environmental hygiene faced by the State. It has also approved two additional courses in MUSC for poultry science and laboratory animal medicine. The Siddha system of medicine is being developed through a postgraduate course in the Palayamkottai college of indigenous medicine, the opening of five Siddha wings in district hospitals and the establishment of 14 Siddha dispensaries in Thanjavur district with the financial assistance of the Hindu Religous Endowment Board. Six such dispensaries are also being organised in other districts. The need for voluntary contributions for the growing health programme in the State is emphasised by the government and the Task Force's working group. The cancer research Institute in Kancheepuram is being developed into a regional research centre and 4 twentyfive bed TB wards are being set up in Ramanathapuram, Tuticorin, Nagapattinam and Krishnagiri.

Science Research: The Central government has announced its acceptance of the Sarkar Committee recommendations on the administration and programme of CSIR which were summarised in Vol I Nos. 9 and 11 of the Bulletin. Its governing body will now be headed by the Director General, with the Prime Minister and the Science Minister being the chairman and vice chairman of the organisation. Thus the management will be entirely scientific. With priorities decided by NCST in favour of applied research, the laboratories can now proceed with their R and D tasks, aimed at contributing to the national goal of technological and scientific selfreliance. For this there must be the closest relations with industry and a system of information collection and processing which will avoid our doing what has been done elsewhere. Now the Council and the National Committee can produce the indigenous technological effort for which the industry in the country is waiting and for which capacity and resourcefulness, and not resources, will be the deciding facts.

Apart from the work of the Karaikudi Institute referred to earlier, MERADO in the Guindy campus, which contributed to the mechanical engineering post of the Avadi heavy vehicles, is working on three important industrial programmes. Fluidics resulting in a fluidic water sprayer, bottling machinery and non-destructive testing equipment are being released to industry. The Madras veterinary college's cytogenetic laboratory is undertaking chronosome studies in human beings and cattle. It is a major centre for the diagnosis of diseases of genetic origin and the breeding of fruit flies later used in the

improvement of a poultry and livestocks. The Indian Institute of Astro physics has installed a 40 inch telescope in Kavalur near Jalarpet. This facility—the largest in the country—will help further develop meteorological research.

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TRAINING DISTRICT PLANNING AND STATISTICAL OFFICERS

The State Planning Commission is at work preparing the State Perspective Plan for the years 1972-84. For this purpose, a Draft Perspective Plan Frame is to be issued in May for discussion in the State and as a guide to all those engaged in the Perspective Plan. The major inputs of the Perspective Plan are :

District Plans ;
Sectoral Profiles; and
Area, Industrial Complex and Regional studies.

The District Plans are being developed by the District Collector, who for this purpose is assisted by a District Planning Cell composed of the District Planning Officer, the District Statistics Officers and other District Officers dealing with Agriculture, Engineering, Education, Co-operation, Industries, Health etc. The District Plans should reach the Commission by 31st July, 1972.

A training programme in District Planning was therefore arranged by the State Planning Commission to instruct District Planning Officers, District Statistical Officers connected with Planning in the Commission in the methodology of District Planning. The training programme ran from Monday 17th April to Saturday, the 29th April, 1972.

The programme consisted of

(a) Morning sessions when the general tools and techniques of Planning's main components of a District Plan were presented and discussed; and

(b) Afternoon sessions devoted to discussion of the six stages of District Plan Formulation as set forth in the final part of this section during the first week and actual preparation of the first and second stages by each participant and discussions on them during the second week. For this purpose, the officers brought with them the statistics collected by the District Statistical Officers under the supervision of the District Collector. They also brought with them district maps showing the items under Stage I.

The Secretaries of the Task Forces set up by the Commission were present when their areas were presented at the morning sessions and participated in the discussion. There was a small library at the Centre available for participants' use during the evenings.

The location of the programme was "Conference Hall", Directorate of Tamil Nadu Archives, Gandhi-Irwin Road, Egmore, Madras-8.

Programmes :

Director	:	Dr. Malcolm S. Adiseshiah, Member, State Planning Commission.
Secretary-General	:	Thiru K. Sundaram, Deputy Secretary, State Planning Commission.

Monday 17th April		*10 a.m. to 1 p.m.*
Inauguration	:	Hon'ble Dr. M. Karunanidhi, Chairman, State Planning Commission.
Guidelines to District Planning	:	Thiru M. G. Raja Ram, I.A.S., Deputy Chairman, State Planning Commission. Thiru G. D. Nandagopal, Director of Statistics.
Planning, National Income, and Social Accounting	:	Dr. V. Shanmugasundaram, Member, State Planning Commission.
		2-30 p.m. to 5-00 p.m.
District Plan Formulation Stage-I (see final part)		Assisted by consultants : Thiru S. Velayudham, Retd. Professor of Economics. Thiru K. Vasudevan, Retd. Prof. of Economics, Vivekananda College, Madras. Thiru C. Jagannathachari, Retired Director, Small Scale Industries Service Institute.
Tuesday, the 18th April		*10-00 a.m. to 1-00 p.m.*
State Perspective Plan Frame — Objectives, — Strategy, — Parameters, — Capital output ratio, and — Plan outlay.	:	Dr. B. Natarajan, Member, State Planning Commission. Thiru G. P. Mathur, Joint Director, Programme Administration Division, Union Planning Commission, New Delhi.
Project Formulation, Sectoral Planning, and Evaluation	:	Dr. D. Bright Singh, Member, State Planning Commission.
		2-30 p.m. to 5-00 p.m.
District Plan Formulation Stage-II (a)	:	Assisted by consultants : Thiru S. Velayutham Thiru K. Vasudevan Thiru C. Jagannathachari.
Wednesday, the 19th April		*10-00 a.m. to 1-00 p.m.*
Resources and District Planning — Means of computing resources, — Plan resources and non-Plan resources, — District Income and Rural — Savings. — Resource mobilisation. —Optimum utilisation.	:	Thiru S. Venkitaramanan, I.A.S., Secretary, Finance Thiru S. L. N. Simha, Director, Institute for Financial Management & Research, Madras-34.
Systems Analysis and PERT programming in District Planning	:	Dr. Kulandaiswamy, Dean of Post-Graduate Studies, Engineering College, Guindy. Prof. K. Ekambaram, Statistical Consultant, State Planning Commission.

	2-30 p.m. to 5-00 p.m.
District Plan Formulation Stage II (b)	: Assisted by consultants : Thiru S. Velayudham, Thiru K. Vasudevan, Thiru C. Jagannathachari
Thursday, the 20th April	*10-00 a.m. to 1-00 p.m.*
Agricultural perspectives and District Planning	: Thiru P. N. Vedanarayanan, I.A.S., Secretary, Agriculture
Irrigation problems and potential and District Planning	: Thiru S. P. Namasivayam, Chief Engineer for irrigation.
	2-30 p.m. to 5-00 p.m.
District Plan Formulation Stage III	: Assisted by consultants : Thiru S. Velayudham, Thiru K. Vasudevan, Thiru C. Jagannathachari
Friday, the 21st April	*10-00 a.m. to 1-00 p.m.*
Dry Farming and District Planning	: Thiru N. Hari Bhaskar, I.A.S., Director of Agriculture,
Forestry and District Planning	: Thiru K. A. Bhoja Shetty, Chief Conservator of Forests.
Animal Husbandry and Fisheries in District Planning	: (1) Thiru G. Venkatachalam, Director of Animal Husbandry (2) Thiru M. A. K. Tayab, I.A.S. Director of Fisheries.
	2-30 p.m. to 5-00 p.m.
District Plan Formulation Stage IV.	: Assisted by consultants : Thiru S. Velayudham, Thiru K. Vasudevan, Thiru C. Jagannathachari
Saturday, the 22nd April	*10-00 a.m. to 1-00 p.m.*
Large Industries and District Planning	: Thiru V. Karthikeyan, I.A.S., Special Secretary, Industries.
Small Industries and agro-Industries in District Planning	: Thiru N. Mahalingam, Member, State Planning Commission.
	2-30 p.m. to 5-00 p.m.
District Plan Formulation Stage V and finalisations of documents	: Assisted by consultants : Thiru S. Velayudham, Thiru K. Vasudevan, Thiru C. Jagannathachari

Monday, the 24th April		*10-00 a.m. to 1-00 p.m.*
Minerals and Mining in District Planning	:	Thiru V. Gopal, State Geologist.
Cottage Industries and traditional crafts in District Planning	:	Thiru V. Padmanabhan, Secretary, Khadi & Village Industries Board.
		2-30 p.m. to 5-00 p.m.
Practical work by participants on Stage-I of the District Plan	:	Assisted by Consultants : Thiru S. Velayudham Thiru K. Vasudevan Thiru C. Jagannathachari
Tuesday, the 25th April		*10-00 a.m. to 1-00 p.m.*
Electricity Supply and District Planning	:	Thiru C. G. Rangabashyam, IAS, Chairman, State Electricity Board.
Rural Housing and District Planning	:	Thiru T. V. Vasudevan, I.A.S., Chairman, State Housing Board.
Rural Water Supply and Drainage and District Planning	:	Thiru S. Kandappan, M.A. Chairman, Water Supply and Drainage Board.
		2-30 p.m. to 5-00 p.m.
Practical work by participants on Stage-II (a) of the District Plan	:	Assisted by Consultants : Thiru S. Velayudham Thiru K. Vasudevan Thiru C. Jagannathachari.
Wednesday, the 26th April		*10-00 a.m. to 1-00 p.m.*
Education, Health Services and Cultural Promotion and District Planning	:	Dr. Malcolm S. Adiseshiah, Member, State Planning Commission.
Regional Planning and District Planning	:	Thiru E. C. P. Prabhakar, I.A.S., Secretary, Rural Development and Local Administration Dept.
		2-30 p.m. to 5-00 p.m.
Discussion by the Participants of the notes on Stage-I and II of the District Plan prepared by the members.		Assisted by Consultants : Thiru S. Velayudham Thiru K. Vasudevan Thiru C. Jagannathachari.
Thursday, the 27th April		*HOLIDAY*

Friday, the 28th April	*10-00 a.m. to 1-00 p.m.*
Consultations with Panchayat Unions, Academic Institution and the District Development Councils in formulating the District Plan :	Thiru P. Sabanayakam, I.A.S., Chief Secretary to Government.
Tourism :	Thiru A. S. Abluwalia I.A.S., Managing Director, Tamil Nadu Tourism Development Corporation
Rural Development and District Planning :	Thiru R. Govindaswamy, Secretary, Task Force Rural Development and Housing.
	2-30 p.m. to 5-00 p.m.
Discussion by the participants of the notes on Stage IX II of the District Plan prepared by members (continued) :	Assisted by consultants : Thiru S. Velayudham Thiru K. Vasudevan Thiru C. Jagannathachari.

Saturday, the 29th April	*10-00 a.m. to 1-00 p.m.*
(a) A model District Plan.	
(b) Assessment of the Training Programme by Members.	
(c) Closure :	Thiru M. G. Raja Ram, I.A.S., Deputy Chairman, State Planning Commission.

Stages in District Plan Formulation

(See Part-III of the Guidelines for District Planning)

Stage-I

For purpose of the Plan, divide the district into three or four sub-regions, which should as far as possible coincide with the Blocks on the basis of

(a) Natural resources, soil, climate and water resources;

(b) Crops and manufactures—large, if any, medium, small and cottage;

(c) Roads, railways, irrigation and electricity distribution; and

(d) Markets, rural and urban, godowns, cultural profile, primary health centres, and hospitals, schools and colleges and administrative centres.

Develop maps for each of the above four elements, using those of the Revenue, Agricultural and Forestry Departments. On this basis, divide the district into three or four fairly homogeneous sub-regions with similar features on all four points.

Stage-II

Next, undertake a detailed and critical assessment for each sub-region of;

(a) its current socio-economic situation as indicated in the four elements under Stage-I. This will involve

(i) Examining and explaining the temperature, rainfall, drainage, and mainstreams as a basis for development of the sub-region.

(ii) Analysing the land (its per acre productivity per crop, wet and dry, forest, fuel wood, horticulture, grass land, soil erosion, alkalinity and ownership) available surface and underground water for drinking and irrigation.

(iii) Estimating quantitatively and assessing qualitatively animals, poultry and fish, and their per unit yield of milk, meat, eggs, hides and skins and draught use.

(iv) Assessing mining activities, if any.

(v) Examining all types of manufactures
—Large industry, if any source of raw materials and number employed.
—modern small industry—capital, raw materials and labour employed.
- traditional crafts—nature, number and employment; and
—cottage industries—nature, number and employment.

(vi) Examining adequacy of roads and road transport, and railways as linking villages and towns with markets, credit, health and educational facilities;

(vii) Analysing main markets, storage and mill facilities;

(viii) Assessing the irrigated system and electricity distribution.

(ix) Analysing the banking and credit facilities, their location, their savings drive, and their serving the neglected sectors;

(x) Assessing the accessibility, holding power and quality of primary and secondary schools and colleges, vocational training programmes, hospitals, primary health centres and veterinary hospitals and piped drinking water facilities;

(xi) Analysing the employment situation based on working population of 15-59 years, occupational distribution, wage rates in different occupations, share cropping, number of unemployed workers and incidence of land reform;

(xii) Analysing the position of the backward classes in terms of land ownership, wage employment, housing, health and educational facilities;

(xiii) Analysing main features of development organisation of the sub-regions;

(xiv) Assessing of cultural life and potential of the sub-regions; and

(xv) Analysing the financial resources available to each sub-region from all sources—State, Panchayat Unions and private.

(b) The projects undertaken during the Fourth Plan period—projects which are both Plan and non-Plan for each sub-region. This will involve analysis of each project in each sub-region in.

Agriculture	Power	Marketing
Forestry	Roads	Health
Animal Husbandry	Drinking water	Education
Fisheries	Storage	Sanitation
Irrigation	Processing	Employment, etc.
		Cultural activities

From the point of view of

—its objective and attainment;

—its contribution to community or State function;

—its synchronisation with other related scheme;

—its procedures for execution; and

—its budget allocation and expenditures.

This stage with its double analysis of (a) and (b) when correlated should indicate for each sub-region:

(i) the local potential and availabilities of agriculture, manufactures, industrial raw materials, power, communications, markets, credit and social services and labour skilled and unskilled ;

(ii) the gaps in development—particularly, that of the backward areas and communities that must be filled;

(iii) the main constraints—resources, human and financial—that the development of each sub-region faces and that must be taken into account in planning for the future; and

(iv) the projects that have failed or are of secondary importance for the development of the region and that should be eliminated.

Stage-III

The third stage is to establish for each sub-region an outline of the major development options for the perspective Plan Period (1972-84). This will involve establishing for each sub-region :

(a) Computation of district and/or sub-regional income by sector and its rate of growth during the years 1972-73 to 1983-84;

(b) The financial resources likely to be available;

(c) The main agricultural and manufacturing activities to be intensified or initiated, and the inputs and infrastructure that they will need;

(d) The supplementary activities by priority that are to be intensified or initiated and their required inputs;

(e) The locations of (c) and (d); and

(f) The Social services and cultural promotion to be provided.

Note : Computations should be based on constant 1970-71/prices.

In establishing this sub-regional outline the seven objectives of the draft Perspective Plan as applied to the sub-regions, viz., full employment, full utilisation of all available resources, increased productivity, opening up backward regions, and provision of basic food, education, cultural activities, health housing and drinking water to the poor sections in the sub-regions should be the determinants.

Stage-IV

In light of the outline in Stage-III the detailed projects would be developed for each sub-region as follows.

	Continuing Project	New Project
1. Title		
2. Location		
3. Objective to be stated in general and quantitative terms.		
4. period of operation		
5. Cost— Capital, Material, Labour, Administration		
6. Source of financing— State, Private, Local Government		
7. Reporting and evaluation procedure		

The project should then be programmed under the Fifth Plan and Sixth Plan.

Stage-V

The last stage is to establish for the district as a whole the total outlay for each of the two plan periods and the resources that will be raised locally (Local Government and Private) and those that will flow from the State.

Stage-VI

On the basis of the analysis in Stages-II and III, outline any inter-district or State projects in the same format as suggested under Stage-IV with specific outline of the contribution that the district can make.

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Second Workshop on Economics Research Methodology :

Vol I of the Basic papers for the workshop has been sent on April 18 to the workshop participants—the 35 Ph.D scholars and the 12 resources personnel. The volume contains the following documents :

Title	*Author*	*Basic Paper No.*
Recent Development in Economic Theory	Dr. V. Shanmugasundaram	1
Identifying Economic Research Themes	Dr. C. T. Kurien	2
Formulating and Testing of Hypothesis	Dr. K. Krishnamoorthy	3

Title	*Author*	*Basic Paper No.*
Use of Case Studies	Prof. K. S. Sonachalam	6
Use of National Sample Survey Data	Prof. S. K. Ekambaram	9
Use of Documentation	Prof. A. Neelameghan	10
Forecasting and Model Building	Dr. N. Srinivasaraghavan	11
Forecasting and Model Building	Prof. E. Max	12
Agriculture Economics	Prof. G. Parthasarathy	15
Mathematics and Statistics for Economists-Course Outline	Andhra University's Statistics Staff	18

It is expected that Vol II containing Basic Papers Nos. 4, 5, 7, 8, 13, 14, 16 and 17 will be despatched on April 21.

In addition to the participants reported in the last issue, Mr. Alwin Prakash from Kerala University Y. G. Jayaram, Mr A L. N Moorthy, Mr. G. Gopal Reddy, Mr. K. Pratap Reddy, and Mr. K Narasimha Reddy, all from Osmania University; Kumari Usha Chaubey and Mr. Iswar Dhingra from North Indian Universities; and Mr. M. Vivekananda from Andhra University Post-graduate centre are also being admitted. Some 60 other applicants have had to be refused.

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Seminar on Area Studies:

The Indian Council of Social Science Research organised a national Seminar attended by 30 specialists to examine the present state of Area research and International relations studies in the country. The seminar was guided by two good trend reports on Area studies by Prof. Bimal Prasad and Dr. Phodnis and on International relations by Dr. A.P. Rana. There was general agreement on the definition of the two terms—Area studies are multidisciplinary undertaking employing interdisciplinary tools, International relations studies are an autonomous disciplinary sector of political science. The studies should be linked to the defined goals, in the context of the new responsibilities accruing today to the Country and should contribute to political cooperation, increased trade, cultural understanding and the advancement of knowledge. From this point of view the major gaps that need to be filled in an order of priority are (a) South and South East Asia, (b) Australia, West Asia, Japan, China, US and USSR, (c) Africa, Latin America and the Carribbean. The Area studies should be problem oriented and International relations studies should emphasise the theoretical, methodological and innovative. There is need for critical and analytical study of the areas, cross cultural study of problems, depth studies on functional basis, prospective studies of areas, and policy oriented studies. In organising these studies at our universities, there are several models to choose from—a self contained interdisciplinary centre, a centre staffed by core staff which calls on the disciplines for staff, the specialisation of different university centres in different parts of an area, and the diversified B.A. course. The means of developing Area studies and International relations research through the promotional and financial help of the ICSSR and UGC include: (a) forming transdiciplinary cells in universities to create on intellectual ferment: (b) establishing in the

country 3 or 4 schools of languages; (c) organising workshop and seminars for the staff; (d) multiplying international relations libraries; (e) developing a reference and clipping service for researchers; (f) establishing a fellowship programme for foreign travel for the researchers, topping off the UGC fellowship with a further 2 year grant, grants for field studies etc., (g) a publications programme in the two fields; (h) assistance from the ICSSR in making government documents available to research scholars; (i) a scholarly association of specialists in this area to be formed. On the basis of these conclusions, the Advisory Committee of the ICSSR and UGC will meet in May to draft a programme of promotion of Area studies and International relations research.

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April Madras Development Seminar:

The April Seminar Paper, The Chemical Industry, by Mr. R. Ramanujam, Professor of Economics, D. C. Vaishnava College, Madras, together with a summary of the discussion on the paper held on Friday April 28 under the Chairmanship of Rev. Fr. A. Devasia, Professor of Economics, Loyola College, Madras, appears as the first article.

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Second article

Another article on Research and Education appears as the second article.

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Correspondence

A further letter from Osmania Research group regarding their follow up article appears under this section.

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Institute Publications — Book Review

The first publication of the Madras Institute of Development Studies, Income Earning Trends and Social Status of the Harijan Community in Tamil Nadu, by A. Vagiswari, Research Assistant in the Institute appeared in April. A review of the Book by Dr. C. T. Kurien appears as the concluding section of this Issue of the Bulletin.

CHEMICAL INDUSTRIES OF TAMIL NADU AND INDIA

By

PROF. R. RAMANUJAM

Head of the Department of Economics, D.C. Vaishnava College, Madras.

Introduction :

The chemical Industry is an aggregate of products like fertilizers, heavy chemicals, dye stuffs, drugs and Pharmaceuticals, synthetic fibres, and miscellaneous chemicals including plastics and resins, synthetic rubbers and fine chemicals. It has recorded considerable progress in the last two decades. Investment in this sphere has risen from a modest figure of Rs. 304 crores in 1960 to Rs. 1,630 crores by 1970. It accounts for an output of the value of Rs. 2,616 crores and ranks fourth amongst the top industries in the country. Twenty five years ago India was dependent for most of its chemicals on imports and the few units that were in existence were struggling for survival. The stimulus given by the World War II and the planned development that has been taking place since Independence has changed the situation. The country is to day as exporter of various chemicals. (Refer Table 1).

The development of the chemical industry is a variable in the growth and development of the country. In fact, modern wars have become so "chemical based" that Stalin declared the Third plan of the Soviet union a 'chemistry plan'. In analysing this Industry various approaches are possible. For instance, we can show that chemical Industry plays a part in providing food, clothing, shelter and all amenities to the people. Again it is possible to show that it plays a part in the primary, secondary and the tertiary sectors. In this paper, the relation of various chemical Industries* to agriculture, the industrial sector and the consumer industries is presented. In the last section of the paper an attempt is made to highlight the important problems that the chemical industries face in general.

Agricultural Sector and the Chemical Industry :

(1) *Fertilisers*: The modest success of the "Green Revolution" through the H.Y.V's is largely traceable to the chemical base that has been created by the fertilizer and the pesticide production. The targets in food and commercial crops are closely linked to the availability of these chemicals. The farmer in fact today does not want to invest in fertilizers, unless, he is assured of adequate plant protection chemicals. The targets of 129* million tonnes of food grains, 8 million bales of cotton, 10.9 million tonnes of oilseeds, 7.4 million tonnes of jute and 15 million tonnes of sugarcane by 1973-74 are dependent on a corresponding growth of fertilizer consumption and production leading to 23 percent addition to (N) 29 percent to P_2O_5 and 41 percent to K_2O as against the actual rate of increase of 11 percent 9 percent and 19 percent for the period 1969-71 (*Hindu Survey of Indian Industry* pages 13(5). Tables 2 and 3 show the production) of fertilizers variety wise between the years '65-'66 to '69-'70 and the state-wise consumption during the four years between '65-'66 to '68-'69. Table (4) provides figures relating to

fertilizer production in Tamil Nadu. The position of this industry is brought out by the figures 1, 2 and 3 at the end of the paper showing the production trends, imports and consumption of the three main fertilizers for the years between 1960-'61 to 1970-'71. There is brisk activity in all the states to increase production in order to ensure self-sufficiency by the year 1973.

(2) *Chemicals for crop protection:* Chemicals play an important part in preventing the frustration caused to farmers by losses due to pests and diseases in agricultural production. Nearly 20 percent of our agricultural production goes to waste, amounting to nearly Rs. 1000 crores of our G.N.P. Farmers become hesitant to adopt new methods unless they are assured of adequate plant protection schemes. The small farmer is seriously handicapped if to his efforts to promote the growth of intensive cultivation with chemical manures, the variety and complexity of the pest problem have also been growing. Table 5 shows the breakup of class-wise consumption of pesticides in 1970. It shows the need to make plant protection a part of the routine operations of agriculture such as ploughing or harvesting. Research is needed to expand this part of chemical Industry.

Chemicals and the Industrial Sector:

Basic Chemicals: In the industrial structure of the country chemical industries find a place in almost all spheres under basic industries. There are the heavy inorganic chemicals, and chemical plant fabrication under capital goods industry. Petroleum, dye-stuffs, man-made fibres, and dyes are the intermediate goods. Drugs and pharmaceuticals, cosmetics and toilet preparations constitute the consumer goods industry. Table (6) gives the various chemicals produced under these heads, together with the number of units of production and their installed capacity. The sixties witnessed a rapid growth of alkali industry raising the production from 1.29 lakh tonnes to nearly 3.62 lakh tonnes with the number of units moving from 19 to 29. In Soda Ash a marginal import has had to be effected though it might have been avoided by an imaginative policy. The position seems to be more difficult with regard to caustic soda.

Capital Goods: In the capital goods Industry, chemical plant fabrication has grown with the value rising from Rs. 7.5 crores in 1965 to Rs. 13.3 crores in 1969 and is expected to reach Rs. 25 crores by 1973. To-day the indigenous fabrication of fertilizers, paper and such other goods is increasing. The big push in the economy largely depends upon the building up of an infrastructure of capital goods for industries.

Petro-chemicals: The most phenomenal development has been in the petro chemical industry. That industry has also the greatest spread effect around it. The consumption of various types of products of this industry is given in Table No. (7), indicating its growth between the years 1965-'69. Nearly 12 chemical items come out of this industry providing raw-materials and other inputs for the development of many other industries. Table No. (7A) the Manali complex in Tamil Nadu and similar units elsewhere have also shown remarkable capacity as an employment generator in various ancillary industries.

Plastics: Yet another wonder child of the modern era is the plastics, which is a multi-purpose product having an ever increasing range of application. It has become a product that can transform our way of life and change the significance of various chemi-

cals and metals that go into the making of our day to day life. The petrochemical complexes have given a great fillip to this industry by providing it raw materials. Table (8) gives the data relating to the growth of the consumption of plastic goods in 1970-71 and the expected quantities for 1973-74. We are yet no where near the international levels of consumption. It is 0.1 kg. per head in India as compared with 29.5 kgs in U.S., 32.5 kgs. in Germany and 16.7 kgs. in Japan. The rigid P.V C. pipes have almost replaced steel and other metallic pipes in many spheres. In fact it would be necessary to devote an entire paper on the varied aspects of this industry. Vast strides have been made in packaging industry with plastics. Many of the textile manufacturers are using films, shrink wrapping and skin packaging and industrial packaging. Thermoformed articles are now very popular and have great market potentiality. Blown bottles in P.V.C. are being used as versatile packing medium. The use of plastics for utility and decorative purposes is gradually expanding. Yet another aspect of this industry is that it has been rightly described as an industry of the small man since no other field offers so many opportunities for entrepreneurs with little investment resources. This industry has special relevance for our developing economy.

Consumer Goods Industries :

Synthetic Fibres : In the consumer goods industry mention must be made of two important areas. (a) synthetic fibres, (b) drugs and pharmaceuticals. It is accepted national policy that the manufacture of cheap cloth must have priority in our poor country. But in the market the demand for man-made fibres are fast expanding. Traditional fibres are being pushed back to a second place. A study of the comparative development of synthetic and traditional fibres shows that the demand for traditional fibres brought down from 70 percent to 53 percent. As one scans through the pages of textile industry, all over the world it becomes evident that the meteoric rise of man-made fibres to a position of enduring significance in the domain of textiles is not due to any fortuitous circumstance. It is the result of a growing mass appreciation of its inherent virtues of economy, utility, durability and versatility. Table (9) traces the expansion of this industry in India. (Refer Table No. (9).

Drugs and Pharmaceuticals: Yet another subsector in the chemicals sector is the manufacture of drugs and pharmaceuticals. From a meagre production of Rs. 10 crores in 1947, it has today touched the figure of Rs. 250 crores. The total investment in this sphere will reach Rs. 300 crores by the end of the Fourth Plan period. There are about 2300 units in the country registered, out of which 100 are large sized units, with others falling under medium and small scale units. While basic manufactures are of the value of Rs. 35 crores, other formulations can be produced to a value of Rs. 175 crores. Basic manufactures are expected to be pushed up to 50 crores by the end of the Fourth Plan. (Refer Table No. 10).

Paints and Varnish : Paints and dyes form another important area that is gaining significance with the growth of structural industries. Colour affords both aesthetic and material protection and as such should be expanded to save losses arising from corrosion. It is estimated that industries loose about Rs. 250 crores due to lack of protection against surface corrosion. The market potential here is enormous and it is again the small-scale sector that comes into play in this area.

Others : In the sphere of infrastructure both economic and social, chemical industries have a great part to play. Transport road and air, is getting on its feet, thanks to the petroleum industry. Power transmission is helped by cables with plastic covering. Education and Research, public health, preventive and curative, are other areas where many chemicals are required. The entire gamut of socio-economic development requires a broad-based chemical Industry.

Problems :

Profitability : The first condition for the success of any industry is the profitability of the venture. It is necessary to make indepth studies of the cost structures so that the technique of analysis and prognosis may be improved. A study of the chemical Industry from this point of view was done with the data secured from the R. B. I's study of public limited companies between the years 1960-'61 to 1967-'68 and the Economic Times study of Chemical Industries for the years 1968-'69 and 1969-'70. The study reveals that the profitability rates present a mixed picture of increasing and declining trends. It is essential that the sources and uses of funds need to be carefully studied. Table (14) shows the profitability ratios as worked out from the data mentioned above.

(2) Raw Material :

The most important problem faced by the industry is that of raw materials. In almost all parts of the chemical industries this is the bottleneck. We can take for instance the Paint and Varnish industry which has a raw material base of 60 percent to 70 percent. The S. T. C. no doubt has done some good work in obtaining materials from U. K. and U.S.A. at competitive prices. But due to lack of co-ordination the Industry hardly benefits by this action. The duties imposed are also prohibitive. The problem becomes more acute in regard to local raw materials like mineral Turpentine. There is again the shortage of linseed oils. Therefore a careful assessment of the raw material requirements should be worked out and channel of supply established for the development of the chemical Industries.

Market Study and Technology :

The third important problem is that of expanding the markets and devising measures to keep pace with the progress with other countries. In this regard it is possible to reverse our braindrain, as is evident from the experience of the recruitment teams which found many employed Indians abroad willing to come to India on much lower salaries, provided their talents are used creatively for the effective growth of the Industrial base of our country.

TABLE 1

EXPORT OF CHEMICALS AND ALLIED PRODUCTS

(in crores of rupees)

S. No.	*Name of the Product*	*1966-67*	*1967-68*	*1968-69*	*1969-70*	*1970-71 (April-February)*
1.	Chemical Elements and compounds	1.95	2.21	3.29	4.43	7.02
2.	Mineral tar & crude chemicals from coal Petroleum & Natural Gas.	1.5	1.73	2.67	3.77	1.13
3.	Dyeing, tanning & colouring materials	1.32	2.05	3.66	4.03	6.63
4.	Medicinal & Pharmaceutical products	3.77	3.33	4.00	5.97	7.74
5.	Essential oils perfume materials etc.	5.27	5.39	6.87	7.12	6.67
6.	Plastic Materials, Regenerated cellulose & Artificial Resins	0.29	0.14	1.81	3.79	2.96
7.	Chemical Material & products	0.77	0.88	1.40	1.19	1.28
		14.87	15.73	23.70	30.30	33.43

TABLE 2

PRODUCTION OF FERTILIZERS (STATE-WISE) (THOUSAND TONNES)

	NITROGEN (N)				*PHOSPHATES (P_2O^5)*			
	1965-66	*1966-67*	*1967-68*	*1968-69*	*1965-66*	*1966-67*	*1967-68*	*1968-69*
SOUTH	21.6	55.6	84.0	143.2	54.8	70.2	83.0	102.0
Andhra Pradesh	—	—	15.7	54.6	11.2	11.1	22.9	55.7
Kerala	9.2	23.6	23.5	37.1	9.8	18.0	14.7	18.1
Mysore	—	—	—	—	7.0	9.3	8.7	2.3
Tamil Nadu	12.4	31.9	44.8	51 4	26.8	31.7	36.6	25.9
WEST	16.6	19.8	102.5	126.3	37.5	48.9	78.6	81.0
Gujarat	—	—	49.6	73.1	12.2	12.0	30.2	35.9
Madhya Pradesh	3.5	4.5	4.7	5.6	8.8	12.3	11.3	6.5
Maharashtra	13.1	35.5	48.3	47.6	16.6	24.6	37.1	38.6
NORTH	71.5	79.9	88.6	152.8	9.9	11.1	22.5	19.9
Haryana	—	—	—	—	—	—	—	—
Punjab	67.2	76.1	78.1	76.6	—	—	—	—
Rajastan	—	—	—	16.1	—	—	6.3	6.2
Uttar Pradesh	4.4	3.5	10.5	60.1	4.5	4.5	7.0	6.6
Delhi	—	—	—	—	5.4	6.5	9.2	7.1
EAST	128.2	134.1	127.5	140.8	16.5	15.5	23.2	10.3
Assam	—	—	—	12.6	3.0	3.2	2.7	2.2
Bihar	90.6	90.3	75.4	73.9	2.9	3.6	5.5	0.3
Orissa	30.8	39.2	47.2	48.1	—	—	—	—
West Bengal	6.8	4.6	4.9	6.2	10.6	8.7	14.8	7.1
INDIA	237.9	309.1	402.6	563.0	118.8	145.7	207.2	213.2

TABLE 3

PRODUCTION (FERTILIZERS) (IN TONNES)

Kind of Fertilizer	1965—66	1967—68	1968—69	1969—70
1. Ammonium sulphate	412,283	434,295	594,234	609,000
2. Ammonium sulphate Nitrate	58,489	61,517	44,610	35,000
3. Urea	52,963	264,000	458,303	1,002,000
4. Calcium Ammonium Nitrate (20.5% N)	477,687	261,744	123,735	—
5. ,, (25% N)	—	277,728	385,900	445,000
6. Ammonium Chloride	17,476	15,743	16,124	16,000
7. Ammonium Phosphate sulphate	49,245	90,313	102,752	85,000
8. Nitro phospate	26,712	1,694	—	—
9. Ammonium Nitrophosphate	—	89,762	86,141	102,000
10. Enriched diammonium phosphate	—	35,897	54,657	50,000
11. Urea ammonium phosphate	—	30,521	154,522 @ (7.7)	200,000
12. N. P. K. Mixtures	—	—	3,380	—
13. Total N	237,889	402,328	562,981	810,724
14. Super phosphate	653,874	867,786	612,396	715,000
15. Higher grades of super phosphate	4,525	29,221	14,657	15,000
16. Triple ,,	—	1,924	2,718	12,000

TAMIL 4

PRODUCTION OF FERTILISERS IN TAMIL NADU (1970) (Tonnes)

	N	P2 05
Neyveli Lignite Corporation	70,000	—
E. I. D. Parry Limited, Ennore, Ranipet.	16,190	18,430
Blue Mountain Estates and Industries Limited, Ennore.	—	7,150
Coimbatore Pioneer Fertilizers Ltd., Coimbatore.	—	6,500
Premier Fertilizers Ltd., Cuddalore.	—	6,500
Shaw Wallace & Co., Ltd., Avadi.	—	12,109
	86,190	50,770

TABLE 5

CLASS-WISE CONSUMPTION OF PESTICIDES (1970) (in tonnes)

No.	*Class of pesticides*	*Consumption*	*% Consumption*
1.	Insecticides	15,765	63.5
2.	Acaricide	70	0.3
3.	Fungicides	7,720	32.7
4.	Herbicides	525	2.1
5.	Rodenticides	200	0.8
6.	Fumigants	140	0.6
	Grand Total	24,820	100,00

* Data released by Pesticides Association of India, 1971

TABLE 6

CHEMICAL INDUSTRIES — PRODUCTION OF BASIC CHEMICALS — 1970

No.	Name of Chemical		No. of units	Installed capacity	Production
1.	Activated bleaching earth	(tonnes)	1	3648	2809
2.	Rare earth chloride	,,	1	4200	3734.0
3.	Potassium Permanganate	,,	2	1950	1211.3
4.	Fire fighting foam compound		1	675	N.A.
5.	Steradent powder	(tonnes)	1	36	2.6
6.	Calex Sulphate dye	,,	1	7200	922.6
7.	Potassium chlorate	,,	3	5574	5400
8.	Sodium chlorate	,,	1	1000	999
9.	Hydrogen Peroxide	,,	2	3800	3600
10.	Sodium perborate	,,	1	600	500
11.	Borax	,,	1	17000	12,200
12.	Boric Acid	,,	1	3000	7200
13.	Sodium thio-sulphate	,,	6	3000	2.200
14.	Sodium sulphate	,,	5	2200	1,400
15.	Sodium bi-sulphate	,,	5	2180	1,800
16.	Sodium meta bi-sulphate	,,	2	203	181
17.	Sodium sulphide	,,	2	2970	1,100
18.	Bromine	,,	1	265	260
19.	Bromides	,,	1	432	260
20.	Aluminium chloride	,,	2	5000	7,885
21.	Synthetic croyolite	,,	2	4796	4,000
22.	Aluminium fluoride	,,			
23.	Hydro-fluoric acid	,,	1	4500	4,040
24.	Sodium hydro sulphate	,,	3	7728	5,700
25.	Calcium carbide	,,	5	69,500	67,000

TABLE 7

PRODUCTION OF SELECTED ORGANIC CHEMICALS (PETRO-CHEMICALS (In tonnes)

No.	*Name of the chemical*	*1968*	*1969*	*1970*
1.	Acetone	4,614	7,495	8,006
2.	Acetylene Black	107	330	379
3.	Benzen	31,454	44,552	49,228
4.	Butadine	2,264	3,204	4,546
5.	Ethylene	12,247	33,772	52,068
6.	Prophylene	2,191	4,181	5,494
7.	Ethylene Glycol	158	2,297	4,998
8.	2—Ethyl Hexanol	363	2,272	6,380
9.	Formaldehyde	18,578	18,297	19,575
10.	Methanol	16,263	9,836	21,280
11.	Phenol	3,386	7,150	9,450
12.	Phthalic Anhydride	3,119	6,501	7,256

TABLE 7A

CONSUMPTION OF PETROLEM PRODUCTS IN INDIA

(Thousand tonnes)

No.	Product	1965	1966	1967	1968	1969
1.	Refinery gas (sold)	67.84	37.72	31.03	24.62	20.19
2.	Liquefied petroleum	43.17	57.45	74.03	99.89	126.28
3.	Aviation gasoline	87.54	73.38	67.61	64.38	62.00
4.	Mogas	1,093.26	1,116.00	1,118.60	1,255.98	1,329.94
5.	Naphtha	30.26	75.45	188.72	460.39	664.94
6.	Kerosine (superior)	2,253.79	2,334.67	2,477.04	2,636.36	2,924.78
7.	Kerosine (Inferior)	272.01	105.25	103.37	179.92	101.05
8.	Aviation turbine fuel	423.85	392.38	464.88	525.64	615.03
9.	Mineral turpentine	30.76	35.53	69.09	43.20	34.61
10.	High speed diesel oil	2,327.01	2,591.22	2,794.13	3,189.48	3,465.14
11.	High Diesel oil	725.35	838.01	853.22	987.36	7,029.58
12.	Larvicide (malarial)	36.68	12.75	11.89	11.14	9.26
13.	Jute batching oil	93.06	81.54	81.75	70.75	58.18
14.	Furnace oil	2,799.22	2,909.75	2,975.08	3,100.31	3,200.42
15.	* Drei oil	90.92	91.80	95.57	96.90	95.48
16.	Low sulphur heavy stocks	57.86	281.14	450.82	668.94	906.57
17.	Hot Heavy stocks	245.19	239.40	216.35	220.94	226.17
18.	Bitumen	588.75	538.05	525.05	622.48	657.70
19.	Lubricating oils	420.06	368.07	422.93	464.41	478.64
20.	Lubricating greases	23.80	99.63	20.45	22.45	22.82
21.	Petroleum coke	57.36	90.92	100.51	123.47	142.29
22.	S. B. P. Spirit/hexane	38.91	38.75	42.36	55.47	62.66
23.	Aromatic compounds	15.84	20.85	28.49	20.35	16.63
24.	Wax	27.15	30.92	31.29	35.45	34.40
25.	Refinery boiler fuel	411.06	591.36	740.87	822.45	994.52

* Tea

TABLE 8

PATTERN OF CONSUMPTION OF PLASTIC GOODS

No.	*Applications*	*1970—71* *MT.*	*1973—74* *MT.*
1.	Flexible film, Calender film etc.	5,000	9,600
2.	Cables and wires	8,500	14,000
3.	Foot wear	7,700	13,000
4.	Rigid pipes and fittings etc.	2,000	8,000
5.	Spread cloth, coated fabric records	4,000	8,000
6.	Rigid film, foils etc.	1,000	5,000
7.	Miscellaneous plastered film	3,000	10,000
	Total	31,200	67,000

TABLE 9

LICENSED CAPACITY AND PRODUCTION

	Rayon				*Synthetics*					
YEAR	*Viscose Filament*	*Viscose staple*	*Acetate*	*Viscose Tyre cord*	*Nylon Filament*	*Polyester Fibres*	*Arcylic Fibre*	*Nylon Tyre cord*	*Grand Total of R & S*	*No. of plants established*
1951	2,461	—	—	—	—	—	—	—	2,461	2
1954	5,019	4,224	386	—	—	—	—	—	9,629	2
1962	26,237	32,382	1,388	696	176	—	—	—	60,879	11
1965	35,213	37,151	2,033	7,512	1,480	1,385	—	—	84,774	15
1970 Production	36,076	63,342	1,959	17,421	9,255	5,331	145	605	1,34,135	17
Licensed Capacity	40,500	26,000	5,400	18,800	16,540	24,400	4,000	2,400	1,38,040	

TABLE 10

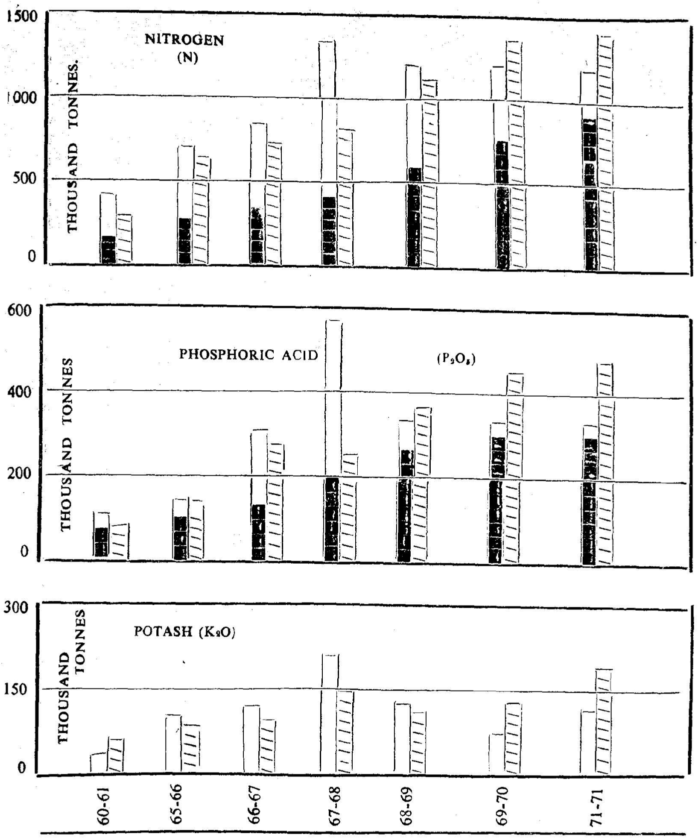
PRODUCTION OF DRUGS AND PHARMACEUTICALS

No.	Name of the Drug	Unit	1960	1965	1968	1969	1970
1.	Penicillin	M. M. U.	40	103	124	161	182
2.	Streptomycin	Tonnes	—	101	133	171	157
3.	Sulpha drugs	Tonnes	130	285	609	791	915
4.	Vitamin A	M. M. U.	14	24	30	32	37
5.	Vitamin B 1	Kg.	—	—	149	1,802	5,395
6.	Vitamin B 12	Kg.	2	44	89	133	141
7.	Vitamin C	Tonnes	—	94	28	148	152
8.	N. H.	Tonnes	29	56	32	29	26
9.	P. A. S. and its salts	Tonnes	83	339	259	297	435
10.	Quinine	Kg.	99,300	47,795	53,128	49,286	50,700

TABLE 11

KEY PROFITABILITY RATIOS — CHEMICAL INDUSTRIES

No.	Year	Gross profits as % of sales	G. profits as % of net worth	Net profit as % net worth	Dividends as % of net worth	Retained profits as % of profits after Tax
1.	1960—61	16.6	13.7	14.7	7.6	48.2
2.	1961—62	15.9	12.6	13.4	7.6	43.6
3.	1962—63	15.4	11.7	11.7	7.1	39.4
4.	1963—64	16.0	11.8	10.9	6.7	39.6
5.	1964—65	15.9	12.7	12.5	7.7	38.8
6	1965—66	13.9	13.3	11.7	6.9	41.2
7.	1966—67	11.7	13.3	12.2	7.0	47.2
8.	1967—68	12.5	11.1	10.6	6.8	36.3
9.	1968—69	13.8	9.2	7.2	5.3	26.2
10.	1969—70	16.9	12.5	12.7	5.9	53.2



Fertilizer Availability Imports and Consumption in India.

Regenal

- Consumption
- Imports
- Indigenous production

In the discussion of the paper at the Seminar held in the Seminar room of the Institute on Friday April 38, under the Chairmanship of Rev. Father Devasia S.J., there was general agreement with the main thesis that the chemical industry is basic to all economic activity in the country and is one of the key variables for the economic growth of the State and the Country. The size and scale of the industry in India place it in the category of large and medium industry. In Tamil Nadu, Madras Refineries, Madras Fertilizers, The Neyveli Lignite Corporation and the developing fertilizer complex under SPIC in Tuticorin fall into the category of large industries. There are a dozen other units which fall into the category of medium scale industry in the State. Government policy with regard to the establishment of large industry and the expansion of the capacity of existing large industry in the private sector has therefore a direct and significant bearing on the future growth of the chemical industry. If the industry is to be for the major part in the privare sector, then the economies of scale point to the need for permitting the establishment and growth of large capacity units. The provisions of the Monopolies and Restrictive Practices Legislation will have to be interpreted and applied in such a manner as to permit such firms to operate on a large scale. On the other hand if the public sector is to take responsibility in a major way for the chemical industry in the Country, organisation and managerial talent will have to be developed to meet the exigencies of this important industry. A further option would be the joint sector along lines of SPIC in Tuticorin where the public and private sectors are joined together in a fruitful development of a large-scale chemical based complex.

The profitability of the chemical industry as set forth in Table XI does not support the disquiet expressed in the paper or referred to in the Studies of the Reserve Bank of India or the Economic Times Research Bureau. All the indices of profitability, gross profits, dividends and retained profits are well above the average of the returns of comparable investments. The trend fluctuations may be related to exogenous factors, the most important of which is the state of industrial relations in the country. Given the number of mandays lost in the chemical industry both in the Country and in the State during the last three years, it is surprising that the trend does not register wider variations. The profitability of the industry is therefore related to the wider issue of industrial peace in the State and the Country.

The case for indepth studies of the cost structure, the market demand, and the techno economic conditions preceding and following the industries operation stand, however, on its own and demand urgent attention. The question of cost structure is also related to the policy objective of the massive distribution of wage goods to the poor majority in the State and the Country. To the low income groups, the supply of coarse cloth, as part of wage goods, in place of synthetic fabrics is related to the cost and price structure of the chemical industry. At present despite its greater durability synthetic fabrics are less economical than coarse cloth. Further market surveys and studies on the techno economic conditions relating to the industry might help in developing a cost and price structure which will bring these goods within the purchasing power range of the low income groups. Similar considerations apply to medicinal and pharmaceutical products which should form part of wage goods.

Another significant feature of the chemical industry is the rising trend of its export component. For 1970—71, in 10 months the industry exported over Rs. 33 crores of products. As the fourth largest industry in the Country it has a great potential in contributing to meeting the higher export target that has been established for the two coming years. While the industry's cost structure is internationally competitive, its further nationalisation would help in attaining the increased export targets in the coming years.

So much of the industry has been set up with foreign collaboration and is still dependent on imported technology. There is a strong case for our national laboratories and science research institutions to develop the needed indigenous technology in the chemical industry. This would also contribute to the policy objective of self reliance. In this connection the recent recruiting town of SPIC was referred to, and the willingness of Indian Scientists working abroad to return home and work on sophisticated and complex projects that characterize the chemical industry was noted. The science plans being developed by the Country and the State, should be directed to a concentrated drive in developing the necessary R and D within the Country.

Among the problems that the Country and the State will be facing in the future is the important one of pollution. There are already straws in the wind in this matter. The atmospheric pollution caused by the chemical industry in Bombay and Manali, the excessive and improper use of pesticides by the farmer, the wrong use of insecticides and fertilizers are future dangers that must now be attended to. The death of 50 cattle in Punjab after eating straw which had been gathered before time after liberal use of pesticides, the identification of chemical traces in milk and eggs in Hyderabad, the tendency of the farmer not to wait for the 14 days' quarantine after use of pesticides, the problems faced by potato growers in the Nilgiris and Kodaikanal—all point to the need for multipronged anti-pollution programme. First the chemical industry itself can chemically control pollutants and contribute antidotes to the pollution caused by the rapid industrialisation of the Country. Secondly legislation is required similar to that in affluent countries, the United States, France, Japan etc., in order to lay down standards for the use of chemicals and establish a net work for enforcing the standards. Such standards and net work can also deal with the problem of adulteration of the chemicals which is a serious problem for the consumer. Finally given the mass illiteracy in the Country and the inability of the farmer to read instructions that accompany the sale of chemical products, the chemical companies and co-operatives should develop a specialized instructional programme to educate the illiterate or semi-literate users in the proper use and dangers in the misuse of chemical products.

RESEARCH AND EDUCATION *

Irrigation Research in Tamil Nadu:

The 1972—73 State Budget for irrigation research provides for :

(a) Schemes for Basic and Fundamental Research on River Valley Projects	...	Rs. 2,78,500
(b) Schemes for Research on open wells and tube wells	...	Rs. 62,300
(c) Irrigation Research experiments	...	Rs. 7,00,000

This rather small annual sum of Rs. 10 lakhs on irrigation research has multiple consequences. On the basis of assumptions relating to the outflow of resultant research findings in improved irrigation technology, facilities and practices, the increase in farm income brought about by river irrigation ranges from 72 to 700 percent over a five-year period and that caused by tube well irrigation ranges from 100 to 1,000 percent in that time period. In all but one case, the small farmer (below five acres) stand to gain more in terms of increase in income per acre than the large farmer (above 20 acres).[1] In addition, there is the saving in water use, and consequent increase in the area that can be irrigated, with the same volume of water following from irrigation research in the State. The modernisation of the Thanjavur Irrigation System and the proper maintenance of the Cauvery, Amaravathi, Vaigai and Thambaraparani Canals are estimated to make available around 40 per cent more water for the State's cultivated area.[2] There are other fall outs from the irrigation research in the State, as for example those which relate to the proposed national Ganga-Cauvery Water Grid. State studies show that with a population of 60 millions by the end of the century, and a gross sown area of 9.7 million hectares, the annual water needs of agriculture will be 139 billion cubic metres, for industrial purposes 20 billion cubic metres and for domestic water supply five billion cubic metres, giving a total annual water demand for the State of 164 billion cubic metres. The State's own water resources are 62 billion cubic metres (being 50 percent of the annual rainfall), leaving a deficit of 102 billion cubic metres. As of now the State receives 15 billion cubic metres from the three neighbouring States of Kerala, Mysore and Andhra and through a linking of the rivers of the four Southern States could import a further 56 billion cubic metres.[3] Such a link between the Southern rivers could be a first practical stage for the proposed national water grid.[4]

1 Bank Credit to Farmers for Irrigation Development Studies in Micro Analysis of Feasibility — Reserve Bank of India, Bombay — 1961.

2 Modernisation of Thanjavur Irrigation System — International Bank for Reconstruction and Development—Washington, 1970.

3 Is Ganga-Cauvery Link necessary and useful ? Prof. P. Kumaraswamy, Madras—1971.

4 Budget Statement—Dr. M. Karunanidhi, Madras—1972.

* Extracts from the paper submitted by Dr. Malcolm S. Adiseshiah to the Technical Symposium on Irrigation Research during the Silver Jubilee Celebrations at the Irrigation Research Station at Poondi in April 1972.

The Inter-disciplinary Demand :

Irrigation research like all research is today increasingly specialised. The early engineering and agricultural colleges and research programmes in the State were concerned with the immediate and practical problems of the highways, railways, building works, plantation and cash crop production and a few irrigation works and canals in the State. Today the engineering and agricultural colleges and research institutions present a vast range of specialisation and complexity, Development in physics, chemistry, physiology, applied mathematics and statistics, hydraulics, mechanics and electricity have led to elaborate experimental designs, methods of empirical analysis and a whole range of new sciences—soil science, plant science, hydrology, heavy engineering, semi-conductors, animal science, poultry science, design engineering, marketing science, etc. While these specialisations are contributing new knowledge to our every day problems, their translation into programmes for the working engineer, agronomist, extension worker, farmer and works manager is held up for two reasons. Each science uses its own terminology which sounds like jargon to the other scientists. But the gap between the research laboratory and the manager in the farm and factory is not only terminological, it is essentially phenomenological. That is, the phenomena faced by the farmer or works manager do not divide themselves neatly into the rigid lines of the scientific departments of the engineering and agricultural colleges and laboratories. The solution to this situation is a double one. First we need more and more extension agents—technical scientists and diploma engineers, who can translate and integrate the results of scientific research from our college and laboratories into the practical problems faced by our farms and factory. This solution to the communication problem still leaves the problem of relating the technical results of research to the goals of efficiency in resource use and profit maximisation which our farmer and our factory manager, in fact the working engineer, the agronomist and the agro-industrialist face in their daily work. I recently came across a very attractive recommendation emanating from one of our fertilizer research laboratories which reads as follows :

lb. of fertilizer (NPK) per acre	*Fertilizer cost per acre*	*Gross return per acre*	*Average return per rupee involved*
	Rs. Ps.	*Rs.*	*Rs. Ps.*
40	7-50	45	18-75
60	10-80	54	15-00
80	14-40	60	12-51
100	18-00	63	10-50

Any economist will point out that this attractive table, with its implicit recommendation that every farmer should invest 100 lbs. per acre because then he would maximise his net income, is of doubtful validity because such a result depends on the amount of capital available (our farmers are perennially capital short); the recommendation takes no cognizance of the prospects of diminishing marginal productivity, which marginal or incremental quantity analysis would reveal; it ignores the opportunity cost prospects.[5] In another case, an irrigation engineer attempted to determine the most profitable purchase of water by the farmer simply by deducting the cost of the water purchases from the increased yield value.[6] Some of the engineering and hydrological computations of the Ganga-Cauvery canal project show this same linear relationship between the product

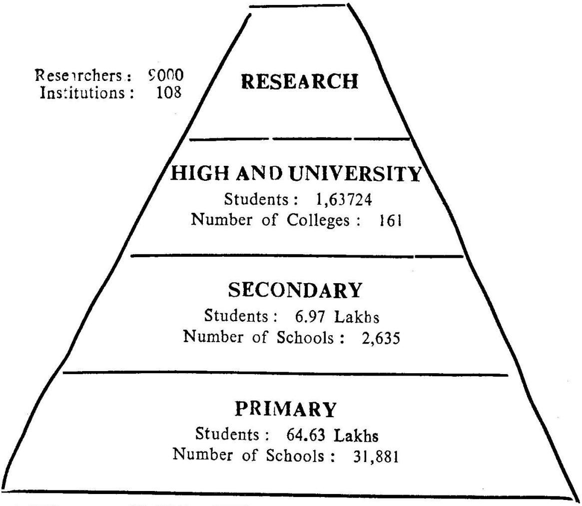
5 Fertilizer Cost and Return—Indian Agriculture, November 1970.

6 Hydrological needs of the small farmer—CNC, Delhi—1969,

output and resource input. Most research projects recommendations are necessarily based on leaving aside the functional relationship of input-output phenomena.[7] Thus the second part of the solution is that use of research results in meeting the problems of the farm and factory require joint action by science and engineering researchers and the economist and possibly the Sociologist. Whether or not a particular piece of research is inter-disciplinary, the application of its recommendations calls into effect one aspect of the relationship of research to education—the joint or inter or multi or transdisciplinary approach. This relationship of research to education which calls for joint studies and action in application also involves restraints on the non-engineer and scientist. I remember being critical of some of the research work in one agricultural research station relating to pollen dust as being marginal to the State's food needs, until I realised that it related both to cattle disease as well as to bee keeping. Similarly, some of the water research which seems unrelated to the needs of the farmer or the house-hold may be related to the water table problem. With these caveats, the educational relation of research can be seen as being grounded in the inter disciplinary joint section that real life situations call for.

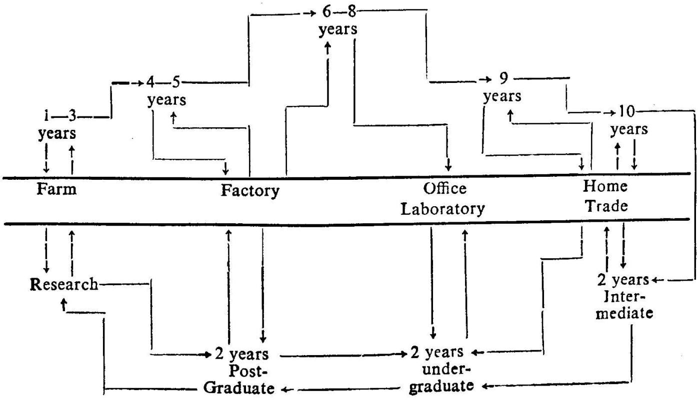
The Research Base:

The Systems Approach: The research base of the State is its education system. In fact the two, education and research, are inseparable both in systems terms and as input. In systems terms research is in a sense the top of the pyramid, whose base is the primary school, middle the secondary level and the layer just beneath summit university and college education. For Tamil Nadu this pyramid may be expressed as follows :



7 Agricultural Production Function E,D.H. Coora and J.C. Dillen, 10WA—1961.

The systems approach to research and education has multiple facets. First it emphasises the inter-related nature of every part with every other part. If the State needs research specialists to work on its problems of irrigation, rural and urban housing, roads and transport, agro-industries, then both the number and scientific expertise of the researchers who are at the top of the pyramid depend on the number and quality of scientists—staff and students—who flow from the layer beneath it, the universities and Colleges who in turn depend on those who came into the universities and Colleges from the secondary Schools, and so on to the primary Schools. In other words, there is a direct thread linking Science teaching and learning at the primary stage to Science research at the Laboratory stage. The absence of learning fundamental concepts and the absence of observation and investigation on local phenomena at the primary stage, the obsolescence of Science in Secondary Schools in terms of out-dated curriculum, teaching methods and techniques including little or no laboratory work and the concentration of our universities and Colleges on Science disciplines which are irrelevant to our needs such as solid state or nuclear physics instead of meteorology, soil physics and geophysics, or the concentration on advanced physical chemistry instead of the chemistry of our food and commercial crops, fruits and vegetables, together with an examination procedure which runs throughout the whole system and which concentrates solely on control and statistical facets of memory and capacity for repetition without assessing educational attainments and encouraging choice of Science for which the student is fitted—all these scientific draw backs of our School and College Systems are reflected in the quality and quantity of research undertaken in the State. A second facet of the systems approach is that the relationship is a double mutual relationship. That is, it is not only that the products flow from the bottom to the top through some kind of inverse law of gravity. The relationship demands that there be a flow from the top down to the bottom. This is non-existent in our education-research system in the State. The primary school—staff and students—is an independent closed circle with only a one way exit to the next stage. The secondary school, the university and college and the research institutions are similarly, each closed Circles with an escape hatch only upward. Hence this aspect—The systems aspect—of education and research in Tamil Nadu demands three kinds of changes. The first is the continuous modernisation of the curriculam, teaching technology and assessment procedures. Second there should be multiple exit and entry points into and out of the education/research system. Third there should be a two fold flow between the different parts of the system. This may be illustrated by the following diagram in place of the pyramid which was earlier considered.



The first conclusion is now widely known and debated and some action on it has begun. Curriculum reform in science is most urgent. Integrated Science learning at the primary level needs to be developed in our State. Here it is not the teaching of something called science but rather the capacity to observe and examine such local phenomena as the growing of seeds, the behaviour of small animals, the flow of water, the electric light in the urban house, etc., that are involved. In secondary education the recent curricular reform in the State has made a start but such reform is never a one shot affair. It is continuous and continuing. Here content analysis and connected discourse are key elements of the curriculum, and these are constantly changing and so must this curriculum. In the university, curricular reform faces the double necessity for up-dating which is fairly satisfactory in our State, but even more for renovating, which involves a programme that will break down the present rigid compartmentalisation of discipline, particularly at the post graduate level. Such a programme will permit grouping of courses for multi-disciplinary training, as the problems that we face in our State are pluri-disciplinary. The teaching and learning technologies that are at our disposal, but which we do not use, enable us to follow the individual learning path of every student, despite the vast increase in the numbers of students; to identify and provide for the gifted student and talented science scholar, and to provide compensatory education for the first generation entrants into our educational and science institutions. These technologies include computor assisted instruction in urban centres, simple programmed instruction, film and film strips, and radio in the rural institutions. For evaluation and assessment, there is general agreement to replace the present examination centred instruction by the semester system, with its system of phased and internal and external assessment and guidance of the learning process and achievement of the student. This system now used in our State in agricultural, engineering, and medical education should be extended first to all science and arts university and college education and later to the high school stage.

The second suggestion is to disaggregate our present education and science system to conform to the skill demands of our society. Today there four exit points from the education system—after class V, class VIII, class XI, B.A., or B.Sc., and M.A. or M.Sc. There are no entry or re-entry points. This system is lumpy and uni-directional vis a vis the skill demands and research requirements of our State. Instead the system could be broken into nine or ten stages as in the above diagram to permit students to leave the system at any point to enter the world of work in the field, factory, office or home, continue his education in his leisure time and re-enter the system at any point for which he is qualified and for which his further skill is needed. Such a change in the educational system will ensure a minimum general education for all Tamilians, continuing education for all who wish or need it, and will reduce if not eliminate the worrying factor of educated unemployment.

The third suggestion is for a two way movement of teachers and researchers between the various stages of the education and research system. If researchers in our laboratories can serve periodically in the universities and colleges and the university and college teachers serve in the laboratories, the present weaknesses in our educational system and hiatus between them and the research institutions can be considerably mitigated and closed. The relation between research and educational institutions is similar to the relation between our engineering institutions and industries. In both cases, the users complain that the products of the educational institutions are unusable in the research laboratory

or industry and the educational institutions complain about the over concentration of the laboratory and industry on applied problems of immediate concern. One corrective would be for a constant two way inter-change of staff between the different institutions. This would give expression to the fact that relationships between education and research are close and are in effect joint activities as far as Tamil Nadu development is concerned. Both involve the same type of personnel, as it is our Universities and Colleges which are the fountain source of the staff of our research institutions. The advance and application of knowledge depends on the scientists graduating from our colleges. And so, while education may or may not be an antonomous development input, it is the means of equipping and adapting our educated personnel to meet the skilled demands of our society.

The problem of the relation between education and research from the point of view of the scientist, engineer and technician is wider. It depends on the relationship between the education and research system but equally on the systems of the recruitment of staff, their relative levels of remuneration and the status of scientific and technical occupations. The recruitment picture in our State shows that too high a percentage of our scientists and researchers come from the middle and upper classes, from urban rather than the rural environment. The backward and scheduled classes seem to be outside the research world. The relative remuneration of the staff is gradually being set right between the research and academic community, but the gap between education, research and industry is wide. As regards the status of our scientists, the problem here is related to our hierarchical political system which seems to exclude the scientist and researcher from the decision making area. A system of integration of education, science and social and technical decision making, along with measures to remedy current disparities arising from social origin can move us forward in effective use of the education and research potential and resources in the State.

The Input Factor : Education and research are a joint input in the process of Tamil Nadu development and production growth. Economists have tried to divide the various inputs which lead to the production output. Assuming constant education and research, Cobb and Douglas accounted for the growth of production as a function of labour and capital inputs. But the constant assumption was false and after a number of stages, today the output of a country is analysed in terms of (a) labour, (b) capital and (c) technical progress. The third input is called the residual factor, or science and technology, or education and research, or intellectual investment. Applied to agriculture, for instance, the final agricultural product (aP) of any project is function (F) of the cropped area (C), the man-hours of labour (L) and the material and intellectual investment (MiLi) giving the formula :

$$aP = F(C, L, Mi, Li)$$

leading to

$$aP = F(C, L, MC, IC)$$

(When aP is the total agricultural production, MC and IC are material capital and intellectual capital)

on to the proposition which applies to developed countries

$$\triangle aP = F(IM, IN)$$

which attributes growth exclusively to material and intellectual investment (IM, IN).[8] For our State it is not necessary to go in for these refinements. For one thing education

8 Intellectual Investment in Agriculture—OECD–Paris, 1963.

and research in Tamil Nadu could become a necessary but never a sufficient condition of its production growth. Today our education and research system as noted earlier is neither a necessary nor a sufficient condition for our economic growth. Further neither the State of our statistical methodology nor our analytical apparatus enables us to isolate and identify the contribution of the various inputs to increased production. In attempting such an analysis we are in danger of forgetting the complexity as well as the functionality of any input-output relationship. There is also the inter-related issue. Take our budding electronics or plastics industry. We can demonstrate a statistical association between research intensity which is the ratio of research activity to output and the rate of growth of these industries. This is rather like the statistical association between night and day. But one is not the cause of the other. That is, it is true that education and research in electronics and plastics (at least as developed in other countries, Japan, Germany, U S.S.R., France, U.K., and U.S.A.) has helped a rapid increase in production in these industries. Equally in these countries and certainly in Tamil Nadu, the determining factor has been the rapid increase in the demand for more and cheaper industrial raw materials which our conventional sources are unable to meet (cotton and packing material being cases in point). This increased demand caused by our population explosion and the rising standard of living of our upper and middle classes, accounts for the growth of our plastics and electronics industries. Our education and research in electronics and plastics is much more a response to the growth of these industries than a cause for their growth. Similarly the fact that some industries (our IAAD and IAAP agricultural areas and the power, fuel, water, fertilizer and pharmaceutical industries) employ more educated and research personnel, is both a cause and consequence. We know from our studies and from observation that education and research of the right kind are needed for our growth.

But we have now reached a stage when education and research should become more of a causal factor in our economic growth than they have been till recently. First the slow down amounting to stagnation of the industrial sector for two years running is both a danger signal and a challenge. In 1970-71 industrial growth which ought to have been 8-10 per cent slumped from the previous year's 7 per cent to 3 per cent. In 1971-72 my computation is that we are likely to register a near nil growth rate or more precisely a 1.9 per cent growth. This is a danger signal because it shows that good agricultural performance (for four years, thanks to the good rains and our agricultural, chemical irrigation and engineering researchers, we have registered a plus five per cent agricultural growth) is no means of increasing manufacturing performance and that a failure of monsoons might have disastrous consequences through slowing down both sectors. It is a challenge because it is a confirmation of the thesis that while agricultural growth can feed and sustain national growth, it is industrial progress that can cause and trigger growth. It is also a challenge to our education and science to apply itself to the non-food production sector of agriculture (cotton, sugar cane, oil seeds) and to the industrial sector in order to bring about the same kind of production spurt that has been caused in what is called our green revolution areas. It is to this kind of mobilisation of education, science and research that the National Committee of Science and Technology at the Centre and the State Planning Commission through its proposal to Government for the creation of Tamil Nadu Development Research Council are addressed. Our education and research must deliver the goods now.

The other reason for pushing forward more aggressively with education and research in our State and Country is the national policy decision regarding self-reliance. Self-reliance has more serious application and implications for education and research than for capital and investment magnitudes. In fact we have now reached a stage of servicing the foreign aid that we have received in the past two decades, such that about 60 per cent of the aid that we now receive or about 27 per cent of our export earnings are being used for repaying the principal and interest on past aid. The addition to our net investment made by aid is around Rs. 250 crores which we can raise through increased savings and mobilisation of our resources during the seventies. But we have been dependent on imported technology and the foreign education and research effort behind it too much and too long. My own computation is that for around 70 of our technology in use in the Country, we are dependent on the Research and Development efforts of Japan, U.S.S.R., Germany, U.K., France, and the U.S. Self reliance means in essence that indigenous education and research must speedily replace this dependence on imported technology. In our State, for example, our own research efforts must replace our reliance on imported know-how in mapping our minerals, our ground water resources, the development of fertilizer complex at Tuticorin, the carbon black project at Manali etc.

The Diffusion Imperative : The inter-relation between research and education has a diffusion aspect. It is the need to create in the public, including our massive illiterate public, a climate of receptivity and understanding of science and its application to their daily life. This is what I would call a programme of scientific literacy which needs to be diffused among our people. Without such a popular mass science base, our research effort will not give the production growth effects that they can. Here illiteracy is a serious fact of our State life—over 60 per cent of our adults are illiterate. But there is no need to wait till the spread of general literacy for undertaking a programme of scientific literacy. The way in which our illiterate or semi-literate farmers have adopted IR-8, 20, 22, etc , and all the technologies that go with them indicates that the spread of an understanding of science and scientific literacy need not wait till they have learnt the three R-s Or to put it negatively, the rate of adopting of High Yielding Varieties of crops is highest in the Punjab with its low rate of literacy and lowest in Kerala with its high rate of literacy. Thus community centred activities, radio (which instructed the Thanjavur and Tiruchirapalli farmers in the technology of Taichung and IR-8 which they came to call Radio Nellu), science clubs for young people, science museums, mobile demonstration units and audio-visual techniques can be used in the effective spreading of scientific literacy. General literacy programmes provided they are functional, that is to say, an integrated programme of occupational training and literacy teaching can also spread science and its application. If the three R-s are taught to the illiterate farmer in the context of learning land and water use, lining his irrigation channels, planting Karuna and Jaya paddy, fertilizer and pesticide use and co-operative society activities or to industrial workers in occupational training, safety in factories, industrial hygiene, then general literacy and scientific literacy will go hand in hand.

Scientific literacy should thus pervade all sections of Tamil society. For the illiterates through demonstration and audio-visual programmes in applying research results to their daily life and occupations ; to the semi-literates and semi-skilled to learn enough science to exploit every opportunity presented to them, to be able to work at their job

more productively and to use effectively all the services—educational, health and sanitation nutritional—that the State and local governments place at their disposal; to the skilled workers graded and intensive scientific instruction so that they can understand, control and improve the tasks they perform which are based on scientific principles; and to the so called educated sector continuing opportunities for scientific education through libraries, extension programmes and special scientific courses both to counter the scientific obsolescence that all of us, educated persons, face, and to forge a contact and communication system between the scientist and non-scientist for achievement of the common goals of increased production, improved distribution and a selective and continuing attack on mass poverty in our State.

CORRESPONDENCE

Letter from Mr. T. Suryanarayana Rao of Osmania University, Hyderabad, regarding the follow up activities of the Osmania Research Group.

Dear Dr. Adiseshiah,

The Osmania Research group is happy that the Second Research Methodology course is being conducted at Waltair during May-June, 1972. The group met here yesterday (28th April) at the University, to congratulate the four scholars selected for the II Work-Shop —Messrs. Jai Ram A.L.N. Murthy, Gopal Reddy, and Pratap Reddy.

Welcoming the four scholars to the research group Dr. Nagaraja Rao explained some of the salient features of the Tambaram work shop for the benefit of the new scholars. He noted that the Waltair arrangements appeared to be more systematic and comprehensive than the earlier ones. The position papers are compiled in a book form and this facilitates better study. The scholars should be able to critically examine the papers and participate in the discussion at the workshop. Dr. Nagaraja Rao felt that individual performance might not be fruitful unless the initiators did a lot of room work and unless there is resourcefulness on the part of the participants. In regard to group performance it would be better if the members met regularly and exchanged notes from one another. The course of Mathematics and Statistics would be successful provided the existing standard of participation is kept in view.

Mr. Suryanarayana Rao who initiated the discussion emphasized that the main element of the workshop is Research Methodology. To optimise the results, the scholars should concentrate on refining the tools of research. Dr. Kurien's paper on identification of the research problem should be carefully studied. Subjects like the structure of the thesis and model building have to be closely followed. Mr. Rao informed that the one year old Osmania Research Group will be larger with the four new scholars joining it. He hoped that the group's work would be continued in the years to come. He congratulated Mr. Narasimhalu for preparing an excellent paper on. "The Mechanics of Development for the M. Litt. Association seminars, and Mr. Seshgari Rao on his being invited to participate in the Congress workers Training Camp of the Bhongir Assembly Constituency. He wished the new scholars success at the Waltair workshop.

The meeting took note of the workshop information contained in the April issue of the Journal of the MIDS.

Sincerely Yours

(Sd.) T. SURYANARAYANA RAO,

Muradnagar, Hyderabad.

Dated: 29-4-1972.

BOOK REVIEW:

Income-Earning Trends and Social Status of the Harijan Community in Tamil Nadu

By

A. VAGISWARI, (RESEARCH ASSISTANT, MIDS), SANGAM PUBLISHERS, MADRAS-1; RS. 7 50

A Profile of Harijan Poverty in Tamil Nadu.

This is the first research monograph published by the Madras Institute of Development Studies in a series of action-oriented research in micro-development problem with special reference to Tamil Nadu. The study of the economic and social conditions of Harijans is of special significance for Tamil Nadu, as among the Southern States Tamil Nadu has the highest percentage of Scheduled Castes, and it occupies the fourth place among all the States in the country in this respect. The study also assumes significance because of the programmes being initiated in the State and the country as a whole for the uplifting of the weaker sections of the population. The Institute and the author of the monograph deserve to be congratulated for bringing out this work which attempts to feature the quantitative dimensions of the problems of Harijans in the State.

In Tamil Nadu Harijans constitute 18 percent of the total population (as against the all-India figure 14.7 percent) and more than half of them live in the five districts of South Arcot, Thanjavur, North Arcot, Chingleput and Madurai. The study is based on investigations conducted in the districts of South Arcot, Thanjavur, Chingleput and Madurai. From these districts a sample of 800 Harijan households and 197 non-Harijan households was drawn and these households were interviewed with the help of questionnaires designed for the study. The households were drawn mainly from villages, in most cases situated at a distance of 2 to 20 miles from a main city or town.

The study brings out many telling facts about the economic and social status of the Harijans in the State. The main findings of the study may be summarised in three propositions: The Harijans live in a state of dire poverty; there are wide economic disparities between the Harijans and the non-Harijans; the Harijans today are worse off than they were ten or twenty years ago.

The per capita income of Harijans computed from the sample is Rs. 227 in 1970 which compares with the State per capita income of Rs. 606 for the year. The per capita income of the non-Harijans in the sample is Rs. 406. The same kind of backwardness and disparities are noted in terms of other indicators as well. Thus according to the provisional Census figures for 1971 literacy among Harijans is as low as 26.6 percent compared to the State average of 39.4 percent and the 43 percent literacy among non-Harijans. The sample also shows the educational backwardness of the Harijans. Among the adult Harijans in the sample only 7.1 per cent were educated upto the level of primary school, 5.6 per cent have studied upto the level of middle school and about 4.3 per cent have been to high school. What is even more distressing is that even among children of primary school going age 34.6 per cent do not attend school.

The study also estimates the poverty of the Harijans using the nutritional method adopted by Dandekar and Rath in their recent estimate of poverty in India. On that basis it is seen that 76.1 per cent of the Harijans in the sample (and 50.8 per cent of the non-Harijans) are below the poverty line, meaning that their annual per capita expenditure is not adequate to consume food items required to provide the minimum calories necessary for tolerable physical existence. This is in itself appalling. But what is really shocking is that according to calculations based on the National Sample Survey 34.4 per cent of the rural population of Madras lived below the poverty line in 1950, and 41.9 per cent in 1960. And, if the sample on which the present study is based is any indication at all, after two decades of planning, and especially in the past decade there has been a steep increase of those who are below the poverty line. That more than three-fourths of the Harijans are below the poverty line is the best summary of their economic position.

In passing, I must point out a technical drawback of the study. While it gives a great deal of informatiom about the income and expenditure of the households in the sample. the methods used in calculating the income is nowhere spelt out. In fact the study says very little about the methods used in arriving at its many quantitative estimates. Considering that it is a research monograph one expected to see in it a copy of the questionnaire used as well as some details of the procedures of obtaining information about familial income. It is hoped that the calculations are not based entirely on the answers given by the respondents. In the absence of such information there is no way of cross checking the estimates made in the study.

Subject to this reservation some more of the findings of the study may be pointed out. Among the four districts studied the position of the Harijans is the worst in Thanjavur. The Harijan per capita income is the lowest there—Rs. 214 as against Rs. 244 in Chingleput, Rs. 260 in Madurai and Rs. 373 in South Arcot. The difference in the average per capita incomes of Harijans and non-Harijans is also the widest in Thanjavur. Thanjavur Harijans have the lowest literacy ratio among the four districts and the percentage of Harijans below the poverty line also is the highest there (84.5 per cent). The agricultural labourers in the Harijan sample in Thanjavur are said to be unemployed upto 150 days a year which is the maximum period of unemployment among the four districts. On the other hand the Harijans in the neighbouring district of South Arcot are relatively better off. Two possible explanations are suggested for the wide differences in the economic and social conditions of Harijans in these two districts. One is that Thanjavur has a higher proportion of Brahmins and hence the Harijans are likely to be at a greater disadvantage there from the religious and social points of view which get reflected in their economic conditions as well. The second possibility mentioned is that Thanjavur is a district of large landlords and very few Harijans possess land. But no attempts have been made in the study to explore this further. There can be no doubt that the extremely poor position of the Harijans in Thanjavur is related to these ownership patterns and the consequence of developments like "the green revolution" under such conditions, but unfortunately the study does not enter into the these questions.

As for the social position of the Harijans the finding is that many forms of discrimination still exist. But the discrimination is more within the personal domain (inaccessibility to the homes of higher castes and in eating with them) rather than in the social

domain (entry into the village temple and drawing water from the common well in the village). It is also interesting to note that the decline in the feeling of discrimination is sharpened with the rise in income.

If such is the profile of the poverty of the Harijans in the rural areas what are the remedies? The study suggests an increased outlay on Harijan welfare so as to ensure that all Harijans are above the poverty line by 1980. For this suggestion is that "there should be a growth rate of 6 per cent for the Harijans for the rest of the Fourth Plan, and 7 per cent during the Fifth Plan and 8 per cent during Sixth Plan". A projection on this basis shows that the per capita income of Harijans in 1980 would be Rs. 555 which is above the figure of Rs. 446 required to cross the poverty line, but still considerably below the per capita income of the general population in 1980 estimated to be Rs. 1320. Apart from this global estimate, an attempt is also made to spell out the details of this strategy of growth. These proceed along conventional lines, marginal redistribution of land, increased institutional credit facilities, higher wage rates and rural works programmes. The financial outlay associated with these programmes has also been worked out. But how are these proposals inter-related and will they come about in the normal course of events? Will the wages of agricultural labourers go up from the existing Rs. 2.61 (for male workers) to the suggested minimum of Rs. 3.90, leave alone the recommended wages of Rs. 5.40? Has not the time come to think in terms of a bolder approach to the problems of mass poverty of the kind revealed by the study? It is shown that 77·4 per cent of the Harijans and 40.6 per cent of the non-Harijans are in favour of rural work programmes and that in Thanjavur, for instance, 90 per cent of the Harijans have expressed themselves in favour of such activities. If so, will it not be possible to organise a district level Land Army whose payment can be partly in kind using our growing agricultural surplus production and who can be moved to any part of the district for the construction of rural housing, roads and work related to drinking water supply? Is not such a siphoning of labour from the traditional agrarian operations necessary to put up the wage rates of agricultural workers in places like Thanjavur? In the case of land distribution also will it not be possible, and is it not necessary to experiment with a few collective farms instead of running into the problems of uneconomic holdings which will result from a mere redistribution of land? Mass poverty cannot be eradicated through conventional fiscal measures and the kind of plans we have been having in the past. It calls for radically different organisational and institutional patterns for which we have the required material resources and personnel. Whether these will be matched by political will is the crucial question.

I hope this monograph will be widely studied and discussed, and I hope too that when it comes to policies to remedy shocking problems, policy makers will not be confined to the limits of conventional wisdom.

Regd. No. M. 8831

MADRAS INSTITUTE
OF
DEVELOPMENT STUDIES
(M I D S)

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